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AMERICAN VARIATIONS OF EPILOBIUM, SECTION CHAMAENERION.

M. L. FERNALD.

IN working over the accumulated material of *Epilobium*, Section *Chamaenerion* chiefly from eastern British America, it has been found desirable to recognize a number of well marked varieties, while a detailed study has forced the writer to conclusions different in certain regards from those recorded in some recent papers on the genus. These results, so far as they seem worthy publication, are recorded under the following subtitles.

I. EPILOBIUM ANGUSTIFOLIUM AND ITS VARIATIONS.

THE common Fireweed, *Epilobium angustifolium* L., of northern regions as represented in a large herbarium seems like a hopeless maze of variations, so great is the diversity in stature, size and shape of leaves, size and color of petals, and the degree to which the inflorescence bears leafy bracts. Many authors have segregated the species into several so-called species and others have attempted the segregation of it into forms; Haussknecht, for instance, in his monograph recognizes fourteen forms. For the most part these forms recognized by Haussknecht are without geographic significance and many of them can be found in any region where *E. angustifolium* is abundant. As the species occurs in North America, however, it is divisible into four somewhat pronounced trends which seem to have a marked degree of geographic isolation, although each of these major trends

of the species includes a great number of fluctuations in the size of flowers, length of pedicels, length of capsules and other features which are paralleled by the fluctuations in the others.

Typical *E. angustifolium*, as it occurs in Europe, Asia and generally across the cool-temperate portions of North America, has the leaves long-attenuate at apex and without obvious lateral nerves. This plant commonly reaches a considerable stature, luxuriant colonies being sometimes 2 m. high, although in arid or sterile situations the plant may be only 0.5 m. in height. The inflorescence of this typical *E. angustifolium* is very elongate, tapering at summit, becoming 1.7–7.5 dm. long. This typical form of the species is, as said, widely distributed across North America and is the plant familiar to most people as *E. angustifolium*.

In southern Alaska, especially from the Aleutian Islands to Sitka, occurs an extreme form of the plant with very large leaves and leafy-bracted inflorescences. In this plant the leafy bracts of the raceme are 2.3–4 cm. broad and these, as well as the foliage leaves, have the secondary nerves very prominent beneath. This is the plant described by Haussknecht as *E. angustifolium*, forma *macrophyllum* and said by him to occur in various parts of extreme northern Eurasia but to be absent from North America, except in the Alaskan region. An exactly similar plant, however, occurs on Brion Island, the outermost of the Magdalen Island group in the Gulf of St. Lawrence, a region in which we have learned to expect frequent identities with the plants of the Alaskan area. This plant, in America restricted to Alaska and the Gulf of St. Lawrence region, would seem to be of more than formal value and is here taken up as a definite geographic variety:

The only phase of *E. angustifolium* known to the writer from the coast of Labrador is a dwarf plant often flowering when only 1 dm. high, but in the larger plants attaining a height of 5 dm. In this plant the leaves are very much shorter than in typical *E. angustifolium* and the mature inflorescence is much shorter than in the typical form of the species, the median cauline leaves being only 3–7 cm. long and the mature inflorescences ranging from 0.4–1.3 dm. in length. This extreme variation with short leaves and short inflorescences is a characteristic plant also of Greenland and it occurs locally southward to Newfoundland and to the alpine region of Gaspé County, Quebec. It is the plant described in 1813 by Wormskjold from Greenland as *E. intermedium* and in 1818 by Schrank from Labrador as *E. pauci-*

florum, under which name the plant was taken up by Meyer in his *Plants of Labrador* and by Schlechtendahl in his enumeration of Labrador plants. Lange, in his *Conspectus of the Flora of Greenland,* treats the plant as a pronounced geographic variety, calling it *Chamaenerium angustifolium β. intermedium.* This plant certainly seems to be more than a dwarf form of *E. angustifolium,* for, in Newfoundland and in the Shickshock Mountains of Quebec where it occurs, it is found in considerable colonies growing by colonies of the larger plant and it seems there to be an entirely distinct variation. Var. *intermedium,* like true *E. angustifolium* has broad- and narrow-leaved forms, the leaves sometimes being extremely slender and linear, in other colonies more oblong; and the flowers have either large or small petals.

In the arid regions of western North America, especially through the Rocky Mountains of the United States and westward into eastern Washington and Nevada, much of the plant called *E. angustifolium* differs from the typical form of the species and from the varieties above discussed in having the leaves scarcely attenuate at apex but merely acutish or even obtusish, so that in a large series of specimens the leaves appear pronouncedly unlike those of the more widely dispersed plant with long-attenuate leaves. This variation was undoubtedly the basis of *Chamaenerium angustifolium platyphyllum* of Daniels, which was described as having the leaves "merely acutish at apex," although the plant upon which Daniels based the variety was an extreme one with unusually broad leaves and leafy bracts. This Rocky Mountain variant extends eastward locally to Minnesota and it is well developed, like many other Rocky Mountain species and varieties, in the subalpine region of Gaspé County, Quebec, where it is abundant in the meadows and gorges of Table-top Mountain. Like the other varieties of the species, var. *platyphyllum* presents broad- or narrow-leaved phases and large- and small-flowered extremes. These, however, are not sufficiently defined nor of definite enough geographic range to be readily separated.

Typical *E. angustifolium* has the petals of the familiar purple or magenta color which enlivens the clearings and burns of the northern states and Canada. The frequent albino of this typical variety, *E. angustifolium,* forma *albiflorum* (Dumort.) Haussk., has pale whitish-green sepals and white petals. On the Gaspé Peninsula of Quebec, where so many phases of the species are found, occurs a very

beautiful color-form well worthy a place in the garden, with the sepals bright red-purple and the petals white, as in forma *albiflorum*. This is the form described from Lapland as *Chamaenerium angustifolium*, var. *spectabile* by Simmons in 1907, by all means the most handsome color-form of the species.

Briefly summarized, the above notes on the variations of *E. angustifolium* which it seems practical to recognize may be stated as follows:

A. Leaves long-attenuate at apex. *B.*
  B. Plant tall, 0.5–2 m. high: median cauline leaves 0.7–2 dm. long: mature inflorescences 1.7–7.5 dm. long. *C.*
    C. Median leaves 0.5–3.5 cm. broad; the secondary nerves not prominent (except in plants from the most exposed habitats): inflorescences open, with small bracts or if leafy-bracted with the lower bracteal leaves at most 2.5 cm. broad. *D.*
      D. Petals purple or rose-color . . . . *E. angustifolium* (typical).
      D. Petals white.
        Sepals white . . . . *E. angustifolium*, f. *albiflorum.*
        Sepals red . . . . *E. angustifolium*, f. *spectabile.*
    C. Median leaves 2–4.5 cm. broad; the secondary nerves very prominent beneath: inflorescences leafy-bracted, the lower bracteal leaves 2.3–4 cm. broad . . . . var. *macrophyllum.*
  B. Plant low, 1–5 dm. high: median cauline leaves 3–7 cm. long: mature inflorescences 0.4–1.3 dm. long . . . . var. *intermedium.*
A. Leaves merely acutish or bluntish . . . . var. *platyphyllum.*

E. ANGUSTIFOLIUM L. Sp. Pl. i. 347 (1753). *Chamaenerion angustifolium* (L.) Scop. Fl. Carn. ed. 2, i. 271 (1772). *E. spicatum* Lam. Fl. Fr. iii. 482 (1778).— In recent clearings, burned lands, damp ravines, etc., chiefly in salicious or sterile regions of the Canadian and Alleghenian zones.

Forma ALBIFLORUM (Dumort.) Haussk. Mon. Gatt. Epil. 38 (1884). *E. spicatum, β. leucanthemum* Wender, Bot. Zeit. (1826) i. 356. *E. spicatum β. albiflorum* Dumort. Fl. Belg. 89 (1827). *E. angustifolium, β. canescens* Wood, Class-book, 262 (1855). *Chamaenerion angustifolium canescens* Britton, Mem. Torr. Bot. Cl. v. 233 (1894).— Occasional throughout the range of the species.

Forma **spectabile** (Simmons), n. comb. *Chamaenerium angustifolium*, var. *spectabile* Simmons, Arkiv för Botanik, vi. no. 17, 14 (1907).— Originally described from Lapland; known in America from QUEBEC: boggy spots, Lac Fortin, Table-top Mountain, Gaspé County, August 9 and 11, 1906, *Fernald & Collins*, no. 660; Flagstaff Peak, Mt. Albert, Gaspé County, July 23, 1906, *Fernald & Collins*, no. 670.

Var. **macrophyllum** (Haussk.), n. comb. *E. angustifolium*, f. *macrophylla* Haussk. Mon. Gatt. Epil. 38 (1884); Kurtz in Engler, Bot. Jahrb. xix. Heft. 4, 381 (1894).— In North America known only from Alaska and from the Magdalen Islands in the Gulf of St. Lawrence. The following specimens belong here. MAGDALEN ISLANDS: sand

dunes, Brion Island, August 6, 1904, *St. John*, no. 1936. ALASKA: Nazan Bay, Atka, 1907, *E. C. Van Dyke*, no. 85; moist meadows, Makushin Bay, Unalaska, August 11, 1907, *Van Dyke*, no. 185; lowland flats, Dutch Harbor, Unalaska, August 13, 1903, *Van Dyke*, no. 199; Nagai Island, Shumagin Islands, August 16, 1872, *M. W. Harrington;* Sitka, 1865–66, *Ferd. Bishoff*.

Var. **intermedium** (Wormsk.), n. comb. *Epilobium intermedium* Wormsk. Athene (1813) 83. *E. pauciflorum* Schrank, Denkschr. Bot. Ges. Regensb. i. Ab. ii. 15 (1818); Meyer, Pl. Lab. 72 (1830); Schlecht., Linnaea, x. 96 (1835). *Chamaenerium angustifolium β. intermedium* (Wormsk.) Lange, Med. om Grønland, Heft. 3, 16 (1880) and 240 (1887).— Greenland, Labrador, Newfoundland, and eastern Quebec. The following are referred here. GREENLAND: without definite locality, *Wormskjold;* Igdlorsuit, west Greenland, August 16, 1881, *Sylow;* Disco, July 23, 1871, *F. M. Fries*. LABRADOR: Rama, August 20–24, 1897, *J. D. Sornborger*, no. 44 (broad-leaved form); spruce grove, Nain, August 11, 1897, *Sornborger*, no. 45 (narrow-leaved form); Hopedale, August 11, 1891, *Bowdoin College Expedition*. NEWFOUNDLAND: Grand Lake, July 15–August 15, 1906, *Owen Bryant*. QUEBEC: common on granitic shores of alpine ponds, Table-top Mountain, Gaspé County, August 7, 1906, *Fernald & Collins*, no. 668.

Var. **platyphyllum** (Daniels), n. comb. *Chamaenerion angustifolium platyphyllum* Daniels, Univ. Mo. Studies, Sci. Ser. ii. no. 2, 176 (1911).— Gaspé County, Quebec; Minnesota, Assiniboia, Alberta, and British Columbia south to New Mexico. The following are characteristic specimens. QUEBEC: meadows and cool gorges of Table-top Mountain, Gaspé County, August 2 and 3, 1906, *Fernald & Collins*, nos. 664, 665. MINNESOTA: Center City, June, 1892, *B. C. Taylor*. ASSINIBOIA: Crane Lake, June 30, 1894, *J. Macoun*, no. 4957. MONTANA: Bozeman, September 15, 1901, *W. W. Jones*. WYOMING: Garfield Peak, July 29, 1894, *A. Nelson*, no. 691; moist open woods, Nash's Fork, Albany County, July 28, 1900, *A. Nelson*, no. 7710; alt. 9000 ft., Big Horn Mountains, July 20, 1900, *J. G. Jack;* Flat Creek, Jackson Hole, July 30, 1901, *Merrill & Wilcox*, no. 1110. UTAH: wet canyon, alt. 9000 feet, Geyser Reservoir, July 11, 1912, *E. P. Walker*, no. 263. NEW MEXICO: Mogollon Mountains, alt. 11,000 feet, August 15, 1903, *O. B. Metcalfe*, no. 510. IDAHO: frequent beneath the yellow pines, alt. 4500 feet, Trinity, August 8, 1910, *J. F. Macbride*, no. 531; among willows, frequent, alt. 7000 feet, Silver City, July 21, 1910, *Macbride*, no. 446. NEVADA: moist ravine, alt. 1850–2500 m., Pack's Station, August 4, 1914, *A. S. Hitchcock*, no. 1022. WASHINGTON: Clark Springs, Spokane County, July 10, 1902, *F. O. Kreager*, no. 126; near Egbert Spring, Douglas County, July 5, 1893, *Sandberg & Leiberg*, no. 407; Fort Colville, 1860, *Lyall*.

II. THE ASSUMED HYBRIDIZATION OF EPILOBIUM ANGUSTIFOLIUM AND E. LATIFOLIUM.

In 1916, Dr. C. C. Forsaith, writing upon *Epilobium angustifolium* and *E. latifolium*, stated that "when *E. angustifolium* grows within the range of its nearest ally [in North America *E. latifolium*], crosses take place which result in hybrid offspring. This relation is strikingly evident from the morphological standpoint at least, when one takes into account the presence of defective microspores in specimens chosen from that part of its habitat coterminous [coincident?] with that of *E. latifolium*. In contrast to this condition there is the more constant development of the pollen in buds selected from the more southern stations where *E. angustifolium* is practically monotypic." [1]

Dr. Forsaith reinforces his argument by the citation of specimens in the Gray Herbarium which had been freely placed at his disposal, indicating by an asterisk those in which he found the pollen defective; he also publishes a map purporting to show the distribution of *E. angustifolium* and *E. latifolium*, indicating in solid black the areas where he believes the two species are coexistent. Lest readers of his article should be led by Dr. Forsaith's courteous reference to members of the staff of the Gray Herbarium (p. 485) to suppose that they indorse the conclusion above quoted, it becomes unfortunately necessary to point out certain facts which might have been detected by Dr. Forsaith himself if he had critically checked his data before publication. The more discerning reader, naturally, will be led to accept with extreme caution the conclusions of a student writing upon geographic distribution who locates Hamilton Inlet in Greenland (p. 477) and the Selkirk Mountains at 118° 20′ *north* longitude (p. 477). Incidentally, if one examines Piper's *Flora of the State of Washington* he will find that *E. latifolium* occurs in Washington only as an arctic-alpine plant and is unknown from the coast, yet Forsaith lists *E. latifolium* with imperfect pollen as represented in the Gray Herbarium from Seattle! The present writer is unable to find any voucher for this statement unless it be a sheet collected by *E. C. Smith* at 6000 ft. on Mt. Rainier and sent out with the label of the Young Naturalists' Society, SEATTLE.

These, of course, are merely clerical errors and, while showing great

[1] Forsaith, Bot. Gaz. lxii. 475 (1916).

carelessness, may be somewhat pardoned; but the other facts which it seems necessary to emphasize are more fundamental in character. In the first place, *E. angustifolium* and *E. latifolium* are thoroughly distinct in their morphological characters (and by *morphology* is meant not merely what can be seen under a microscope) and in their habitats, and only at the southern or lower limits of the range of *E. latifolium* are they generally coexistent.

Briefly the chief morphological differences between the species may be summarized as follows:

E. angustifolium	*E. latifolium*
Stems solitary or few, erect.	Stems numerous, depressed or arched-ascending.
Leaves membranaceous, green above, reticulate-veiny beneath, linear- to oblong-lanceolate, and, except in the arctic-alpine var. *intermedium*, 7–20 cm. long.	Leaves thick and fleshy, very glaucous on both surfaces, not veiny, elliptic-ovate to lanceolate, 2–8 cm. long.
Style pilose at base, in maturity exceeding the stamens.	Style glabrous, much shorter than the stamens.
Stigmas slender and elongate, becoming revolute.	Stigmas short and thick, not becoming revolute.
Seeds oblong, 1–1.3 mm. long.	Seeds fusiform, 2 mm. long.

The habitats and ranges of the two species, as already indicated, are likewise very different. *E. angustifolium* is widely dispersed over boreal and cool-temperate regions, extending south in eastern America to North Carolina and Kansas, and growing chiefly in humus or in recently burned areas of the less calcareous regions. *E. latifolium*, on the other hand, is an arctic-alpine calciphile, extending in eastern America south to Newfoundland, Saguenay County and the Gaspé Peninsula, Quebec, and James Bay, the southern lobe of Hudson Bay. Throughout the southern part of its range the plant is local and apparently confined to calcareous or argillaceous river-gravels, its known stations between the Straits of Belle Isle and the Rocky Mountain region being as follows: Forteau, Labrador; 70–80 miles up the Natashquan River, Saguenay Co., Quebec; gravel bars of Mingan River, Saguenay Co., Quebec; gravel deposits of the rivers of Gaspé, Matane and Bonaventure Cos., Quebec, west to the Matane River (longitude 67° 40′ w.) and the Grand Cascapedia (longitude 66° w.); Fort George and vicinity, James Bay (longitude 79° w.); St. Mary's River, Alberta (longitude 113° w.). In other words, there is abso-

lutely no evidence known to the taxonomist and the students of our northern floras of *Epilobium latifolium* in the vast Canadian region between the Matane River (longitude 67° 40′ w.) and the east coast of James Bay (longitude 79° w.) nor between Hudson Bay and southwestern Alberta (longitude 113° w.); and, consequently, the elongate black area indicated on Dr. Forsaith's map in south-central Canada (from west-central Ontario across the plains of southern Manitoba to southeastern Saskatchewan) is supported by no evidence whatever in the herbarium nor in trustworthy records.

Yet on pages 475 and 476, in the list of specimens of *E. angustifolium* examined by him, Dr. Forsaith marks 12 out of the 18 specimens from eastern Canada (east of the Rocky Mts.) and the Black Hill and Great Lake regions as having imperfect pollen and being, therefore, by his assumed premise, of hybrid origin. According to Müller *E. angustifolium* is visited chiefly by bees, wasps and flies, and in order to gain a conception of the flights required of the bees (the strongest fliers) by Forsaith's inference, that all plants of *E. angustifolium* in southern Canada and the Great Lake region with defective pollen are the results of hybridizing with *E. latifolium*, it is worth while to measure the distances from the nearest stations of *E. latifolium* to the stations of plants of *E. angustifolium* which he considers to be of hybrid origin. His 12 stations between the Straits of Belle Isle and the Rocky Mountains are, therefore, listed below, following the sequence in Dr. Forsaith's paper (beginning with Labrador, crossing the continent to California and Alaska, then back to Greenland and Labrador and retracing a transcontinental route to the Pacific); and after the name of each station is indicated the distance in an air-line to the nearest known station of the very local *E. latifolium*.

Blanc Sablon River, Labrador, 10 miles to Forteau.

Seven Islands, Quebec, 90 miles to Mingan River.

Lake Edward, Quebec, 210 miles (as far as from New York to Washington or from Chicago to Toledo) to Matane River.

Rivière du Loup, Quebec, 125 miles (as far as from New York to Philadelphia or from Chicago to Madison, Wisc.) to Matane River.

Mt. Albert, Quebec, 20 miles and a descent of nearly 4000 feet to the gravel deposits of the lower River Ste. Anne des Monts.

Mungo Park, Lake Nipigon, Ontario, 450 miles (as far as from New York to Raleigh, Eastport or Quebec or from Chicago to Omaha, Kansas City or Buffalo) to Fort George.

Brown Co., Wisconsin, 750 miles (as far as from New York to Milwaukee or Savannah or from Chicago to Bridgeport, Conn., Wilmington, N. C., or Winnipeg) to Fort George.

Crane Lake, Assiniboia, 175 miles (as far as from New York to Boston or from Chicago to Indianapolis) to St. Mary's River.

Table-topped Mt., Quebec, 20 miles and a descent of 3000–4000 feet to the gravel deposits of the lower River Ste. Anne des Monts.

Mt. Albert, Quebec, 20 miles and a descent of nearly 4000 feet to the gravel deposits of the lower River Ste. Anne des Monts.

Turin, Marquette Co., Michigan, 625 miles (as far as from New York to Grand Rapids or Columbia, S. C., or from Chicago to Ottawa or Baltimore) to Fort George.

Pluma, South Dakota, 150 miles (as far as from New York to Harrisburg or from Chicago to Dubuque) to the Rocky Mountains.

Incidentally, the "hybrid" *E. angustifolium* of Surrey, England, listed by Forsaith, is toward 1000 miles (and half that distance across the North Atlantic) from Iceland, the nearest area where *E. latifolium* is indigenous; likewise the production of the "hybrid" *E. angustifolium* from Sapporo, Japan, must have proved a difficult problem for the bees, since it is necessary entirely to leave the Japanese Archipelago in order to find any *E. latifolium*.

These data, easily verified in any large herbarium, should be sufficient to indicate that when Forsaith apologized for the West Virginian specimens with imperfect pollen by saying that these "without doubt, have resulted from physiological conditions" (p. 474), he should have extended a similar explanation for much of the other material with imperfect pollen.

Forsaith states that the hybrid nature of these plants "is strikingly evident from the morphological standpoint"; yet nowhere in his discussion does he make a comparison of the obvious morphological differences of the stems, leaves, styles, stigmas, and seeds, nor suggest that in these most patent characters do the "hybrids" show the slightest degree of blending or of inconstancy. Haussknecht, who freely recognized hybrids in *Epilobium*, and the many other taxonomists who are equally ready to recognize them between some species of the genus, have seen no reason even to surmise that hybridization occurs between *E. angustifolium* and *E. latifolium;* and if Forsaith has made the real discovery that such hybrids exist it is a pity that he did not point out in which of the many strongly divergent characters his hybrids show recombinations. That the two species are highly vari-

able everyone of extended experience knows too well, and it sometimes seems as if De Vries could nowhere have found a better subject for the study of mutations.

In fact, less than two years prior to the publication of Forsaith's paper, Jeffrey made the following seemingly authoritative statement: "all the pollen grains of *Epilobium* (*Chamaenerion*) *angustifolium* are perfectly developed. I have examined the pollen of the species under discussion from widely separate geographical regions and under different conditions of growth and season, with the uniform result, that the pollen is perfect and invariable in any important respect. *E. angustifolium* is a species which apparently is not known to hybridize with other species and indeed it is not easy to see how it could cross with those having their pollen grains in tetrads. The perfection of the pollen in view of this condition appears particularly significant. The failure of *E. angustifolium* to hybridize in nature with other species of the genus is doubtless due to the fact that it is morphologically very distinct from these and would in all probability produce, if artificially crossed, only sterile hybrids." [1] Somewhat earlier, likewise, Jeffrey had asserted with positiveness that the pollen of *E. angustifolium* is perfect, saying in his paper, *The Mutation Myth*, "In all the abundant material of the species examined the pollen was entirely normal." [2]

In less than two years, then, as indicated by Forsaith's publication from Professor Jeffrey's laboratory, *Epilobium angustifolium*, with the abruptness of a De Vriesian mutation, changed from a species in which "the pollen is perfect and invariable in any important respect" to one in which, in the northern United States and southern Canada, England, Japan, and elsewhere outside the range of any other species with simple pollen grains, the pollen is said to be frequently imperfect. That imperfection of pollen in this species cannot be asserted to be due to hybridization with *E. latifolium* should be apparent from the vast distances (often 100 to 1000 miles and sometimes overseas) between the supposed hybrid offspring and the nearest colonies of one of the assumed parents.

GRAY HERBARIUM.

[1] Jeffrey, Am. Nat. xlix. 11 (1915).
[2] Jeffrey, Science, n. s. xxxix. 490 (April, 1914).

ON THE NAMES OF SOME SPECIES OF VIBURNUM.

S. F. Blake.

For many years a small *Viburnum* of the *V. dentatum* group, strongly marked among our New England species by its very short-petioled leaves and prominent stipules, has been known by the name *Viburnum pubescens* Pursh,[1] based on *V. dentatum β. pubescens* Aiton.[2] While working at the British Museum in 1915, I had an opportunity to examine not only the type of Aiton, on which the specific name must rest, but also the Solander manuscript of the Hortus Kewensis; and the study of this material shows that the name *V. pubescens* can by no means be used for the plant which has borne it so long, but must be applied to the species which was described by Britton [3] in 1901 as *Viburnum venosum*.

In the Solander MSS. *Viburnum dentatum* and its varieties are twice dealt with, once on pages 761–763 of volume seven, and again on pages 765–767 of the same volume. The second of these treatments, which is the important one for the determination of the application of the name *V. dentatum* var. *pubescens*, runs as follows:

"dentatum. † Viburnum foliis ovatis subcordatis serrato-dentatis plicatis.

"*lucidum*. α. foliis utrinque glabris, petiolis elongatis. Viburnum dentatum. *Linn. Spec. pl. 384.* 4.

"*pubescens*. β. foliis ovato-oblongis acuminatis subtus villosis, petiolis elongatis.

[1] Pursh. Fl. Am. Sept. i. 202 (1814).

"V. pubescens; foliis ovalibus acuminatis dentato-serratis plicato-sulcatis subtus villoso-tomentosis, cymis pedunculatis, fructibus oblongis.

"V. dentatum pubescens. *Ait. kew.* l. *p.* 168.

"V. dentatum tomentosum. *Mich. fl. amer.* 1. *p.* 179.

"In the lower parts of Virginia and Carolina. ♄. June. *v. v.* The whole of the shrub smaller than the preceding one."

[2] Ait. Hort. Kew. ed. 1. i. 372 (1789); ed. 2. ii. 168 (1811).

"*dentatum*. 8. V. foliis ovatis dentato-serratis plicatis. *Sp. pl.* 384. *Jacqu. hort.* l. *p.* 13. *t.* 36.

"lucidum. α foliis utrinque glabris.

"Shining tooth'd leav'd Viburnum.

"pubescens. β foliis acuminatis subtus villosis.

"Downy tooth'd-leav'd Viburnum.

"*Nat.* of North America.

"*Introd.* 1736, by Peter Collinson, Esq. *Coll. mss.*

"Fl. June and July. H. ♄."

[3] Britton, Man. ed. 1. 871 (1901).

"*sessile*. γ. foliis ovatis acutis subtus villosis, petiolis brevissimis hirtis.

"Habitat in America septentrionali prope Montes Kattskill. J. Bartram. Frutex vix tripedalis. J. Bartram. Obs. Hoc... [illegible] — distincta species?"

The types of these three varieties are all in the British Museum. The type of α. *lucidum*, from "America sept. J. Bartram 1764 [after which 77 has been written in pencil]" is good *V. dentatum* L. as now taken by all authors. The type of β. *pubescens*, marked "Hort. Dr. Lee," and labeled in Solander's own hand, is a characteristic specimen of the plant now passing as *V. venosum* Britton. A tracing of this specimen is now in the Gray Herbarium. The type of γ. *sessile*, a flowering scrap with a detached leaf and portion of cyme, labeled "America sept. Katskill mountains J. Bartram 1764 [after which 74 is added in pencil] 3 pedalis," is the species now passing as *V. pubescens* (Ait.) Pursh and so designated, for instance, in the last edition of Gray's Manual.

By reference to the treatment in Aiton's Hortus Kewensis as issued, given in a previous footnote, it will be seen that Solander's γ. *sessile* was dropped entirely, and that there is consequently no reference in that work to the plant now called *V. pubescens*. Pursh's name *V. pubescens*, being based directly on the β. *pubescens* of Aiton, must therefore be transferred to the species now called *V. venosum* Britton. It is probable, furthermore, that the plant which Pursh really had in mind as *V. pubescens* was *V. venosum*, for the only specimens of the *V. dentatum* group collected by Pursh which I was able to find at the Kew Herbarium consisted of a branch of *V. venosum* on a sheet with two scraps of the somewhat pubescent form of *V. dentaium*, the whole labeled *Viburnum dentatum* in an old hand which Mr. Skan, the librarian at Kew, was not able to identify.

The oldest name which has been considered to refer to the short-petioled plant, the *V. pubescens* of authors but not of Pursh, is *Viburnum villosum* Raf. Med. Rep. N. Y. hex. II. v. 361 (1808). Rafinesque's name being debarred from use in any case, because of an earlier and valid *V. villosum* of Swartz (1788), his plant was renamed *V. Rafinesquianum* by Schultes in 1820 (Syst. vi. 630). Although this name (*V. villosum* Raf.) may perhaps refer to the short-petioled plant, it is so poorly described and figured (in an inedited plate of Rafinesque) that its adoption for our plant seems very undesirable.

Rafinesque's description reads only "Viburnum villosum; leaves ovate, serrated, hairy, umbell [sic] 5 fidous, few flowered. Grows in Pennsylvania." This description is unfortunately too brief and indefinite to exclude *V. venosum* (i. e., the true *V. pubescens*) or *V. scabrellum* (T. & G.) Chapm., both of which also occur in Pennsylvania, and the character "umbell 5 fidous" is one not known, at least normally, in any of these species, all of which have a consistently 7-rayed umbel. The plate to which reference has been made throws no further light on the question. It is a tracing, executed many years ago for Dr. Sereno Watson, of the unique proof of one (no. 17) of a series of plates intended to illustrate Rafinesque's "Select New Plants of North America," but lost in his perhaps fortunate shipwreck of 1815 and consequently never published.[1] This tracing shows a plant with 5-rayed short-villous umbel, few flowers, oval-ovate obtusish or acutish densely ciliolate leaves, short, ciliolate, estipulate petioles, and short-villous stem, and on the whole bears perhaps more resemblance to *V. scabrellum* than to *V.* "*pubescens*." However, as it seems impossible ever to identify it with any certainty, the name had best be dropped entirely, and with it the *V. Rafinesquianum* of Schultes, which rests directly on it.

No other name seems to have been given to any form of the short-petioled plant[2] until 1911, by which date the name *V. pubescens* had become firmly fixed by universal usage on the very short-petioled and pubescent form of the East. In that year a form from Missouri, which had been distributed and also grown at the Arnold Arboretum under the name *V. affine* Bush, was briefly characterized by Schneider under that name in his Handbuch as a doubtfully distinct species, and was shortly after reduced by Rehder to a variety of *V. pubescens* (of authors), and distinguished by its somewhat longer petioles and less pubescent leaves.

Examination of all the material of the so-called *V. pubescens* at the Gray Herbarium and the Arnold Arboretum fully confirms Mr. Rehder's view that two varieties of the old "*V. pubescens*" may be distinguished with fair clearness. One, with leaves rather densely soft-pubescent all over the under surface, between as well as on the

[1] An account of this collection of plates, by W. R. G[erard], will be found in Bull. Torr. Club xii. 37–38 (1885).

[2] The name *Viburnum pubescens* var. *petiolum* (sic) Fitzpatrick (T. J. & M. F. L.), Proc. Iowa Acad. Sci. vii. 198 (1900), refers very clearly to *V. molle* Michx. (*V. Demetrionis* Deane & Robinson).

veins, is the common eastern plant, extending south and west to Georgia, Michigan, and Manitoba. In this plant the petioles are generally very short, 3–7 mm. or even less, although sometimes somewhat longer. In the other plant, which must be considered the typical form of *V. affine* as here taken, the leaves are pilose beneath only along the veins and in their axils, not between them, and the petioles are commonly longer (12 mm. or less). This plant is of more restricted and western range, being represented in the two herbaria consulted only from Ontario, Illinois, Iowa, Minnesota, Virginia, and Missouri. Mr. Rehder tells me that both these varieties have retained their distinctive characters during a number of years' cultivation at the Arnold Arboretum.

It seems best, therefore, to adopt for the plant which has been passing as *Viburnum pubescens* (Ait.) Pursh the name *V. affine* Bush, and that it may be eligible for use under the International Rules, to provide it with a Latin diagnosis, as follows.

VIBURNUM AFFINE Bush.— *V. affine* Bush! ex Rehder in Sarg. Trees & Shrubs i. 135 (1903), nomen; ex Schneider, Ill. Handb. Laubholzk. ii. 649. f. 415, *l–m* (1911), without Lat. diag. *V. pubescens* var. *affine* (Bush) Rehder, Mitt. Deutsch. Dendr. Gesell. 1913. 263 (1913), without Lat. diag. *V. pubescens* auth., not Pursh.— Frutex. Folia ovata acuta dentata (dentibus 4–9-jugis) supra sparse pilosa vel glabrata subtus plus minusve dense pilosa (pilis simplicibus) venosa (venis 5–7-jugis) 3.5–7 cm. longa 2.3–4.2 cm. lata, in petiolis 2–12 mm. longis ad basin conspicue 2-stipulatis. Cymi 7-radiati, floribus ca. 6 mm. latis. Drupae purpureae, putamine compresso in faciebus leviter 2-sulcato.— Represented in the Gray Herbarium from Vt. south to Ga. and west to Mo. and Manitoba.

The species may be separated into the two following varieties.

Var. **affine** (Bush) comb. nov. (typical form).—Folia subtus in venis et in axillis venarum plus minusve pilosa ceterum glabra; petioli saepe usque ad 12 mm. longi.— *V. affine* Bush. *V. pubescens* var. *affine* (Bush) Rehder.— Ont., Ill., Minn., Ia., Va., and Mo.

Var. **hypomalacum**, var. nov. Folia subtus dense pilosa; petioli saepius 3–7 mm. longi.— *V. pubescens* of most auth., not Pursh.— Type from VERMONT: Ferrisburg, fl. 17 June 1881, fr. 7 Aug. 1880, *C. E. Faxon* (TYPE in Gray Herb.).— Vt. and Ont. to Ga., Mich., and Manitoba.

Another *Viburnum*, the name of which has become somewhat confused, is the American form of *V. Opulus* L., which has commonly been called *V. Opulus* L. var. *americanum* (Mill.) Ait., a name said to rest on *V. americanum* Mill. Gardn. Dict. ed. 8. no. 8 (1768). The type of *Viburnum americanum* Miller in the British Museum, however,

is nothing more nor less than *Hydrangea arborescens* L. The name V. Opulus var. americanum Ait. Hort. Kew. i. 373 (1789) (as β. *americana*), which was published without reference to Miller's name, may continue in use for the plant.

The changes in nomenclature here proposed may for convenience of reference be summarized as follows.

Viburnum affine Bush.— *V. pubescens* auth., not Pursh. For varieties, see discussion.

Viburnum pubescens (Ait.) Pursh.— *V. venosum* Britton.

V. pubescens (Ait.) Pursh var. **Canbyi** (Rehder).— *V. venosum* var. *Canbyi* Rehder, Rhodora vi. 60 (1904).

V. pubescens (Ait.) Pursh var. **longifolium** (Dippel).— *V. dentatum* var. *longifolium* Dippel, Handb. Laubholzk. i. 183 (1889). *V. longifolium* "Loddiges" Zabel, in Beisnner, Schelle, & Zabel, Handb. Laubholz-Ben. 441 (1903). *V. venosum* var. *longifolium* (Dippel) Rehder, Rhodora vi. 61 (1904).

Viburnum Opulus L. var. americanum Ait.— *V. Opulus* var. *americanum* " (Mill). Ait." of auth.

Gray Herbarium.

REPORTS ON THE FLORA OF THE BOSTON DISTRICT,— XXVI.

ROSACEAE.

AGRIMONIA.

A. gryposepala Wallr. Rich woods and thickets, frequent.

A. mollis (T. & G.) Britton. Moist woods, Oak Island, Revere; open woods on talus of diorite, Horn Pond Mt., Woburn.

A. striata Michx. Woods and roadsides. No stations reported from southeastern towns; frequent elsewhere.

ALCHEMILLA.

A. vulgaris L., var. vestita (Buser) Fernald & Wiegand. Five plants in a chicken-yard, Westford (*Emily F. Fletcher*, September 22, 1906, in Rhodora ix. 92, 1907, as *A. pratensis* F. W. Schmidt). See Fernald & Wiegand, Rhodora xiv. 233, 1912.

AMELANCHIER.

See RHODORA xiv. 117–161, 1912.

A. laevis Wiegand. Woods and thickets. Not reported from southeastern towns, but reported as common elsewhere.

A. oblongifolia (T. & G.) Roem. Swamps, thickets and roadsides, very common throughout.

A. sanguinea Wiegand. Rich woods, Groton (*C. H. Knowlton,* May 13, 1905). See RHODORA xiv. 240, 1912.

A. stolonifera Wiegand. Dry sandy soil and ledges, common throughout. A form with small petals has been discussed in RHODORA x. 33, 1908, by B. L. Robinson, as var. *micropetala;* in RHODORA xiv. 132–134, 1912, by K. M. Wiegand, as a possible hybrid (*A. oblongifolia* × *stolonifera*); and in RHODORA xviii. 48–49, 1916, by C. A. Weatherby, as a teratological form.

A. laevis Wiegand × **oblongifolia** (T. & G.) Roem. Frequent where both species are found.

CRATAEGUS.

C. alnorum Sarg. Dedham (*E. F. Williams,* May 24, 1896).

C. apposita Sarg. Tyngsboro (*F. S. Collins,* May 15, 1910); Hopkinton (*F. S. Collins,* May 30, 1887).

C. Arnoldiana Sarg. Bussey Brook, Arnold Arboretum, type station (*J. Robinson,* May, 1880, et al. to date); Lowell (*C. H. Morss,* May 28, 1901); Medford (*L. L. Dame,* —, 1887); Mystic Pond near end of Hastings Lane, Medford (*C. S. Sargent,* Sept. 7, 1901).

C. Brainerdi Sarg., var. **Egglestoni** (Sarg.) Robinson. One station, Wellesley (*K. M. Wiegand,* —, 1909).

C. CRUS-GALLI L. Introduced near Jamaica Pond [W. Roxbury] (*C. E. Faxon,* no date).

C. intricata J. Lange. (*C. coccinea* Eggleston in Gray's Manual, ed. 7, 1908). Peabody, Winthrop, Dedham, Sharon, Southborough, Medfield.

C. macrosperma Ashe. Pastures and thickets, frequent.

C. macrosperma Ashe, var. **acutiloba** (Sarg.) Eggleston. Occasional.

C. macrosperma Ashe, var. **pastorum** (Sarg.) Eggleston. Wellesley (*K. M. Wiegand,* Sept. 20, 1909).

C. MONOGYNA Jacq. (*C. Oxyacantha* of Gray's Manual, ed. 7, 1908). Persistent and occasionally spontaneous, especially near Boston.

C. PHAENOPYRUM (L. f.) Medic. Escape in pasture, Dorchester (*J. R. Churchill,* Oct. 17, 1886 et seq.); Jamaica Plain (*C. E. Faxon,* Sept. 26, 1883 et seq.). Introduced from the South.

C. pruinosa (Wendl.) C. Koch. Ashland (*Thomas Morong,* June 5, 1882). Specimen in herb. Walter Deane. A plant of this species with bluish leaves was transplanted from Orient Heights, Winthrop, in October, 1899, by C. E. Faxon and J. T. Dawson, and is growing in the Arnold Arboretum (No. 4572).

C. pruinosa (Wendl.) C. Koch., var. **conjuncta** (Sarg.) Eggleston. Topsfield (*T. E. Proctor,* Oct. 22, 1900, June 7, 1901); Southborough (*C. S. Sargent,* Sept. 4, 1904). Specimens in herb. Arnold Arboretum.

C. pruinosa (Wendl.) C. Koch., f. **dissona** (Sarg.) Eggleston. Dry roadside, Franklin (*K. M. Wiegand,* Sept. 13, 1911).

C. rotundifolia Moench. Frequent; all reported stations north of Boston.

C. rotundifolia Moench., var. **Faxoni** (Sarg.) Eggleston. Needham (*K. M. Wiegand,* Aug. 27, 1909).

C. submollis Sarg. Wall near Prof. Sargent's, Perkins St., Jamaica Plain type station (*C. E. Faxon,* May 14, Sept. 17, 1902). Also reported from N. Andover, Andover, Lowell, Chelmsford, Revere, Winthrop, Medford and Milton.

C. succulenta Schrad. (*C. macracantha* Lodd.) W. Newbury (*A. A. Eaton,* —, 1896); Ipswich (*Wm. Oakes,* no date; *C. S. Sargent,* Sept. 13, 1900); Revere (*H. A. Young,* —, 1877; *C. E. Faxon,* Sept. 27, 1883.)

DALIBARDA.

D. repens L. Deep woods; Middleton (*J. H. Sears,* Aug. 20, 1883); Manchester (*J. Robinson,* June 3, 1875); Holbrook (*Alice G. Clark* in RHODORA vi. 227, 1904).

EXOCHORDA.

E. GRANDIFLORA (Hook.) Lindl. Spreading and forming thicket on rocky knoll, site of abandoned garden, Arlington (*C. A. Weatherby,* Aug. 4, 1908, May 15, 1909). Native of central China.

FILIPENDULA.

F. Ulmaria (L.) Maxim. An infrequent escape from gardens to moist soil.

FRAGARIA.

F. grandiflora Ehrh. Dump near Charles River Road, Cambridge (*A. S. Pease*, May 27, 1905); roadside thicket near garden, Lynnfield (*M. L. Fernald*, June 16, 1907). Common garden strawberry. Probably frequent.

F. vesca L. Dry soil, occasional.

F. vesca L., var. **americana** Porter. Rich woods, rare; Boxford, Woburn, Stoneham, Norfolk.

F. virginiana Duchesne. Fields and meadows, very common throughout.

GEUM.

G. canadense Jacq. Moist shady places, common throughout.

G. rivale L. Meadows and swamps, common.

G. strictum Ait. Meadows and moist roadsides, occasional from Blue Hills northward.

G. urbanum L. South Salem (*J. H. Sears*, July 10, 1885). Thoroughly introduced in Cambridge (*W. Deane*, July 2, 1884 to date); appearing in cultivated ground, rare, Wellesley (*F. W. Hunnewell 2d*, June 10, 1912).

G. virginianum L. Swamps and wet places, occasional from Cambridge to Norwood and Sherborn and northward.

PHYSOCARPUS.

P. opulifolius (L.) Maxim. Persistent or escaping at Lowell, Cambridge, Melrose and Milton; perhaps elsewhere.

C. H. Knowlton } *Committee on*
Walter Deane } *Local Flora.*

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C. H. Knowlton } *Committee on*
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THE AMERICAN RANGE OF BOTRYCHIUM LANCEOLATUM.[1]— In recognizing as a distinct species, *Botrychium angustisegmentum*,[2] the Appalachian plant previously described as *B. lanceolatum* var. *angustisegmentum* Pease & Moore,[3] Professor Fernald has pointed out that in Europe true *B. lanceolatum* is a subarctic or arctic-alpine plant of limited distribution, and has discussed its American range as follows: "In North America it occurs within the Arctic Circle in Greenland (latitude 63° N.) but is unknown elsewhere in the East; in the West it extends from the Aleutian Islands to Mount Ranier in Washington and the Selkirk Mts. in British Columbia. South and east of these mountain stations its occurrence is doubtful, for although often said to reach Colorado, it is noteworthy that in preparing his *Flora of Colorado* Rydberg was unable to verify its occurrence there." Subsequently[4] Mr. F. W. Hunnewell reported having collected a specimen in the Yellowstone National Park, Wyoming, in 1914; and there is a Yellowstone specimen in the National Herbarium, collected many years before by Frank Tweedy.

Botrychium lanceolatum occurs in Colorado and Quebec, also, as shown by specimens in the National Herbarium. The Colorado collections are two: "Mt. Antero, spur of Sawatch Range," Aug. 1880, *T. S. Brandegee;* and "Glacier Lake, alt. 8,500 ft., on dry gravelly slopes composed of disintegrated granites," July 5, 1914, *E. Bethel.* Mt. Antero, named for an Indian chief, is in the region of Mt. Yale and Mt. Princeton. Mr. Brandegee writes that there are three Colorado specimens in his own herbarium, marked as collected by him in 1880 at an altitude of 10,500 feet in the Sawatch range. The Glacier Lake specimen of Mr. Bethel is large and complete, and altogether characteristic.

The Quebec record rests upon excellent specimens collected by Mr. William Palmer, Aug. 17, 1887, among grasses on a sandy beach at the mouth (eastern side) of the Mingan River, but a few rods distant from the Gulf of St. Lawrence. This extension of range, though notable, is not surprising.— WILLIAM R. MAXON, Washington, D. C.

[Besides the southern stations for *B. lanceolatum* recorded by Mr. Maxon the following may now be added: In sand, Pt. aux Basques, Seven Islands, Saguenay Co., Quebec, 1907, *C. B. Robinson*, no. 836

[1] Published by permission of the Secretary of the Smithsonian Institution.

[2] RHODORA **17**: 87. 1915.

[3] RHODORA **8**: 299. 1906.

[4] RHODORA **17**: 143. 1915.

(Herb. N. Y. Bot. Gard.); near timber line, alt. 10,000–12,000 feet, high mountains about Gray's Peak, Colorado, August 20, 1885, *H. N. Patterson*, no. 164, in part (in Gray Herb.). Patterson's no. 164 was distributed as *B. Lunaria*, the material of this number in the Gray Herbarium consisting of three typical plants of that species and one of *B. lanceolatum*. Following the clew given by Maxon, an examination of an envelope of Brandegee's material in the Gray Herbarium from the Sawatch Range, labeled *B. Lunaria*, reveals seven plants of that species and one of undoubted *B. lanceolatum*. These two mixtures of *B. lanceolatum* with *B. Lunaria* indicate that *B. lanceolatum* should be sought where *B. Lunaria* occurs.— M. L. F.]

Additional Wool Waste Plants.— Miss Emily F. Fletcher, who has so frequently recorded interesting foreign plants appearing on fields fertilized with wool waste, has recently sent some notable specimens to the Gray Herbarium. At North Chelmsford she found *Erodium laciniatum* (Cav.) Willd., var. *Bovei* (Delile) Murbeck, a native of Egypt, Tunis, and Algiers. At Westford she collected *Sphaeralcea Fendleri* Gray, a native of western Texas, Arizona, etc. Her most dramatic discovery was the occurrence at Westford of *Wissadula callimorpha* (Hoche) Hassl., var. *Friesii* Hassl., a native of eastern Bolivia and adjacent Brazil, which was not known to science until 1906, and even now is represented by only three collections. Miss Fletcher has inquired at the mill and ascertained that among the various sheep-raising districts from which wool was imported during the last two years to Westford, was "South America as far south as Chile and Argentine." This is circumstantial evidence which helps to explain the presence of this unusual plant in Massachusetts.— Harold St. John, Gray Herbarium.

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NOTES ON THE CLAYTON HERBARIUM.

S. F. Blake.

One of the earliest works on the flora of the United States was Gronovius's Flora Virginica, the first edition of which was published at Leyden in two parts in 1739 and 1743, the second in 1763. Worked out at Leyden with Linnaeus's assistance in the 1730's, from the series of specimens sent to Gronovius by John Clayton,[1] clerk of Gloucester County, Virginia, it is of extreme importance as affording the chief basis of perhaps the greater number of North American plants published in the Species Plantarum. Although Clayton's herbarium, now incorporated in the general collection of the British Museum, has been frequently consulted by American workers, especially by Dr. Gray, no systematic examination of the whole collection appears to have been made, at least in recent years. While working at the British Museum in 1914 and 1915 I had an opportunity through the kindness of Dr. A. B. Rendle of making a careful study of the whole collection, and the rather numerous changes in nomenclature necessitated by the reidentification of Clayton's specimens are here brought together.

The interpretation of Linnaean names based on several prelinnaean references representing more than one modern species has always been a matter of difficulty, and has often led to serious differences of opinion. The uncertainty often attending the attempt to unravel the confused tangle presented by the Linnaean synonymy has in some cases led authors to cut the Gordian knot by arbitrarily typifying the Linnaean species by the specimens in the Linnaean Herbarium. It

[1] See Britten, Journ. Bot. xlvii. 297–301 (1909), for an interesting account of Clayton.

is or should be well known, however, that the specimens in the Linnaean Herbarium are not types in the modern sense (except in rare cases, when Linnaeus's species were based entirely on specimens in his herbarium at the time of publication), and their identity is often only of minor significance. It was Linnaeus's practice to add at any time specimens which he considered to represent species described in the Species Plantarum or other works, which has in the past been a source of some confusion to botanists who have examined his herbarium. Through the careful studies of Mr. B. Daydon Jackson,[1] now fortunately accessible to all, it is possible to learn the date of accession of all specimens in the Linnaean Herbarium, and thus to estimate their value as representatives of the Linnaean species.

Too much stress has been laid, especially by modern geneticists, on an assumed fundamental difference between Linnaean and modern ideas of species. The Linnaean species, properly considered, was not a mere aggregation of more or less closely related entities, but in its essentials identical with the specific units of the great majority of reputable botanists since his time. Composite and sometimes hopelessly confused species he had, but they were due in great part to the fact that his material was so largely merely bibliographical, and even modern botanists have sometimes based new specific names on specimens in hand which when examined by other workers have been found to represent not merely two or more species but sometimes even distinct genera. The gradual tightening of specific lines, from Linnaeus's day to our own, has been due in the main not to an alteration of ideas but to more careful study of better and more abundant material, and to the discovery of constant and significant differences in the smaller and less obvious structures of the plant formerly little attended to. The conflict in the specific ideal comes not between that of Linnaeus and that of the modern systematist, but between the latter and that of the geneticist, and its settlement must be left to the future.

If then the Linnaean species, when an aggregate, differs in no essential from any modern aggregate species, how is it to be typified? Only in exceptional cases can the Linnaean Herbarium solve the question. The "first citation" method, although it may sometimes be of service, is surely not to be adopted as an arbitrary rule. The principle of the "name-bringing synonym," likewise, though often useful, is by

[1] B. D. Jackson, "Index to the Linnean Herbarium," Proc. Linn. Soc. 124th Sess. Suppl. 1–152 (1912).

no means so clear or so significant in its application to prelinnaean synonymy as it has been found to be in the case of modern binomials, and should not be too hastily resorted to. When a prelinnaean polynomial has been wholly or largely adopted by Linnaeus for his diagnostic phrase (the "nomen specificum" of Linnaeus, whose "nomen triviale" has become our modern "specific name"), the plant so honored should certainly be considered as entitled to the restricted Linnaean name, unless some valid objection to this course can be presented. In many and perhaps most cases, however, the application of Linnaean names must be determined by the action of subsequent authors, and here choice must be made between two courses, different in their methods but sometimes leading to the same end. By what may be called the process of *unconscious elimination*,— through the creation of new specific names for units involved in a given Linnaean species by subsequent authors, without reference to or (so far as is shown by published notice) knowledge of their connection with that Linnaean species,— the latter may eventually be reduced to a single entity to which the name might be restricted. On the other hand, an author with a knowledge of the several entities constituting a Linnaean species as originally described may, even after the more or less complete dissection of a Linnaean species in the manner just described, restrict it to some one of its original components, perhaps already named, and assign a new name to that portion of it to which, by the first method of procedure, the Linnaean name would be restricted. This second method, which by the way is the one now adopted by ornithologists for the determination of generic types, seems the soundest that can be adopted. It is scarcely necessary to add that such further use of this power of subsequent designation of the type as may be necessary should not be arbitrary, but should where possible incorporate the established work of previous authors who have not been guided by this principle.

1. *Scirpus capitatus* L. Sp. i. 48 (1753).[1] From the subjoined Linnaean diagnosis it will be seen that this species was based almost entirely on the Gronovian reference, which in turn is based on *Clayton* 380, now in the British Museum. This specimen is the plant now

[1] *Scirpus capitatus.*
"5. SCIRPUS culmo tereti nudo setiformi, spica subglobosa.
"Scirpus culmo setaceo nudo, spica subglobosa. *Gron. virg.* 12.
"*Habitat in* Virginia."

known as *Eleocharis tenuis* (Willd.) Schultes, with which it has previously been identified by Gray and C. B. Clarke, although no published record has been made. In the Linnaean Herbarium are two sheets representing *S. capitatus*: 1st., a sheet of the plant now known as *Eleocharis capitata*, received from Patrick Browne in 1758, and consequently of no importance in fixing the type of the species; 2nd., a sheet of *E. obtusa* (Willd.) Schultes, collected by Kalm and known to Linnaeus before 1753. As the description in the Species Plantarum refers mainly to the Clayton specimen, it is necessary to regard this as the type of the species, the Patrick Browne specimen being, as already noted, of no consequence in this connection since it was not known to Linnaeus before 1758. It therefore becomes necessary to adopt for the widely distributed tropical and subtropical species that has been called *Eleocharis capitata* the name ELEOCHARIS **caribaea** (Rottb.) Blake, based on *Scirpus caribaeus* Rottb. Descr. Pl. Rar. Progr. 24 (1772); Descr. Ic. Nov. Pl. ed. 1. 46. t. 24 (1772); ed. 2. l. c (1786). The variety with purplish-brown scales and purplish-black achenes, localized at the southern end of Lake Michigan, becomes E. CARIBAEA var. **dispar** (E. J. Hill) Blake (*E. dispar* E. J. Hill, Bot. Gaz. vii. 3 (1882); *E. capitata* var. *dispar* (E. J. Hill) Fernald, RHODORA viii. 126 (1906).

The name *Eleocharis capitata* (L.) R. Br., Prod. Fl. Nov. Holl. i. 225 (1810), has a somewhat peculiar status. It was based on "Scirpus capitatus Linn. sp. pl. ed. Willd. 1. p. 294," but was expressly distinguished from the Gronovian plant, which of course Brown had examined, type of *S. capitatus* L. Since however Willdenow's *S. capitatus* is based directly on Linnaeus's, the application of Brown's name must be determined by the Clayton plant on which rests the name-bringing synonym of Linnaeus. The name ELEOCHARIS CAPITATA (L.) R. Br. must therefore now be restricted to the plant which has long been called *Eleocharis tenuis* (Willd.) Schultes.

2. *Scirpus autumnalis* L. Mant. ii. 180 (1771).[1] This species was based solely on *Clayton* 772, which, as well represented in the Linnaean Herbarium and the Clayton Herbarium, is the plant known in

[1] *Scirpus autumnalis*.

"SCIRPUS culmo ancipiti nudo, umbella decomposita foliosa, spiculis ovatis.

"Scirpus foliosus pusillus antumnalis [*sic*], culmo plano utrinque paullum compresso. *Clayt.* 772.

"*Habitat in* Virginia.

"Facies *Junci pilosi*. . . &c."

recent years as *Fimbristylis Frankii* Steud. Syn. Pl. Cyp. 111 (1855), for which the name *F. geminata* (Nees) Kunth has been adopted in the second edition of Britton & Brown's Illustrated Flora (i. 322 (1913)). The name Fimbristylis autumnalis (L.) R. & S. Syst. ii. 97 (1817) must accordingly be transferred to this species. The form with contracted inflorescence, described by Prof. Fernald, Rhodora xi. 180 (1909), from Orono, Maine, under the name *F. Frankii* var. *brachyactis*, seems best treated as F. autumnalis (L.) R. & S. forma **brachyactis** (Fernald).

The plant now passing as *F. autumnalis* has received numerous names at different times under several genera, among which the oldest seems to be *Scirpus mucronulatus* Michx. Fl. i. 31 (1803). The types of this species in the Michaux Herbarium at Paris have obligingly been examined by M. Gadaceau of the Paris Herbarium and pronounced identical with material sent him of the southern species hitherto called *F. autumnalis*. The *F. autumnalis* of our present manuals must consequently become Fimbristylis **mucronulata** (Michx.).

The type of *Scirpus complanatus* Retz. (= *Fimbristylis complanata* (Retz.) Link), in the British Museum — a species sometimes synonymized with *F. autumnalis* of authors — represents a different species, with which *Harris* 11618 from Jamaica (in the British Museum) agrees very well; the type of *Cyperus amentaceus* Rudge, Pl. Guian. 16. t. 19 (1805 ?), is identical with it.

A considerable range extension of the true *F. autumnalis* (*i. e.*, *F. Frankii* Steud.) is indicated by some rather young plants in the British Museum from Nuttall, labelled "R[ocky] Mts.," which I am unable to distinguish from this species.

3. *Schoenus glomeratus* L. Sp. i. 44 (1753).[1] Examination of the extensive series representing *Rynchospora glomerata* (L.) Vahl and its so-called var. *paniculata* (Gray) Chapm. in the Gray Herbarium shows that the two are specifically distinct, as they were originally treated by Dr. Gray. The more northern plant, which has passed as true *glomerata*, has an achene 1.5 mm. long (including the crustaceous "perianth-"

[1] *Schoenus glomeratus*.

"8. SCHOENUS culmo triquetro folioso, floribus fasciculatis, foliis planis, pedunculis lateralibus geminis.

"Schoenus culmo triquetro, pedunculis geminis lateralibus, floribus conglomeratis. *Gron. virg.* 131.

"*Habitat in* Virginia."

base, but excluding the style) and 0.8 mm. wide, while in the more southern var. *paniculata* the achene is 2 by 1.5 mm. and much more umbonate. In the southern plant, moreover, the spikelet is usually 1-fruited, in the northern plant 2–3-fruited, as long ago noted by Kunth (Enum. ii. 296 (1837)) in describing the southern form as *R. glomerata* var. *robustior*. This difference in size and shape of achenes, which runs with great constancy through a series of more than 115 collections of the two plants, in combination with other differences in size of plant, breadth of leaf, looseness of inflorescence, and number of achenes in the spikelet fully confirms the specific distinctness of the two plants.

Both the specimen from Kalm in the Linnaean Herbarium, which has recently been re-examined for me through the kindness of Mr. B. Dayton Jackson, and the plant of Clayton (no. 585) on which the Gronovian citation is based, belong to the large-fruited southern plant which was named *Rhynchospora paniculata* by Gray in 1835, and has of late years been treated as a variety of *R. glomerata*. It will now be necessary to restrict the name Rynchospora glomerata (L.) Vahl, Enum. ii. 234 (1805), to the large-fruited plant, Gray's *R. paniculata*, which as shown above deserves specific recognition. This species seems to have no noteworthy variations.

The first name which can be taken up for the more northern-ranging species which has passed as typical *R. glomerata* seems to be *Schoenus capitellatus* Michx. Fl. i. 36 (1803). Michaux's specimens were long ago identified by Dr. Gray (mss. notes in Gray Herb.) as "a state of *R. glomerata*,— from which the description is mostly drawn,— and a young *R. Elliottii*" (= *R. schoenoides* (Ell.) Wood). Wishing to secure more precise information as to these specimens, I sent specimens of *R. glomerata* (i. e., the plant so called in our manuals), *R. paniculata*, *R. schoenoides* (*Curtiss* 6625), and *R. axillaris* to Dr. H. Lecomte, director of the Paris Herbarium, with the request that they be compared with the material in the herbarium of Michaux. His assistant, M. Gadaceau, has kindly sent me the following notes on the material referred to *Schoenus capitellatus* in the herbaria of Michaux and of Drake del Castillo.

"1. Herbiers du Museum. Deux feuilles d'herbier. L'une comprend, comme l'indîquent les étiquettes au crayon signées A. Gray qui y sont jointes deux formes: *Rhynchospora glomerata* Vahl, *R. Elliottii* A. Gray. L'autre offre quatre beaux échantillons du *Rhyn-*

chospora glauca Vahl. Tous ces échantillons sont accompagnés d'une étiquette signée de Michaux, avec le nom de *Schoenus capitellatus.*

"2. Herbier Drake. Cet herbier contient quatre feuilles de plantes de Michaux (Herbarium Richard). 1. Étiquette *Schoenus fascicularis* signée Michaux — deux échantillons: l'un qui est bien le *Rhyn. fascicularis* Vahl, l'autre qui est le *R. Elliottii* A. Gray non Dietr. 2. Étiquette *Schoenus* (sans nom d'espèce) signée Michaux — C'est le *R. glomerata* Vahl! 3. Étiquette *Schoenus capitulatus* (*sic*) signée Michaux avec l'annotation: 'Setulae retrorsum muricatulae! an *S. glomeratus* ? Walth.— Caroline.' Ces échantillons ont été rapportés, avec raison, par Richard (Achille, non Louis Claude) au *R. glauca* Vahl. 4. Deux échantillons étiquette *Schoenus distans*, signée Michaux, avec l'annotation '*S. glomeratus* L.?. Caroline'. Ces échantillons ont été rapportés, avec raison, par Richard (Achille) au *Rhync. glomerata* Vahl.

"Résumé — Nos plantes de Michaux étiquetées *Schoenus capitellatus* correspondent aux *Rhync. glomerata* Vahl.; *R. Elliottii* A. Gray non Dietr.; *R. glauca* Vahl."

Although, as will be seen from the above, the status of Michaux's specimens is even more confused than was indicated by Dr. Gray, it seems best to avoid the creation of a new name for the species by adopting Michaux's *S. capitellatus* and typifying it by the undoubted specimen of *R.* "*glomerata*" in the Michaux Herbarium. The species called *Rynchospora glomerata* in our current manuals then becomes Rynchospora capitellata (Michx.) Vahl, Enum. ii. 235 (1805).

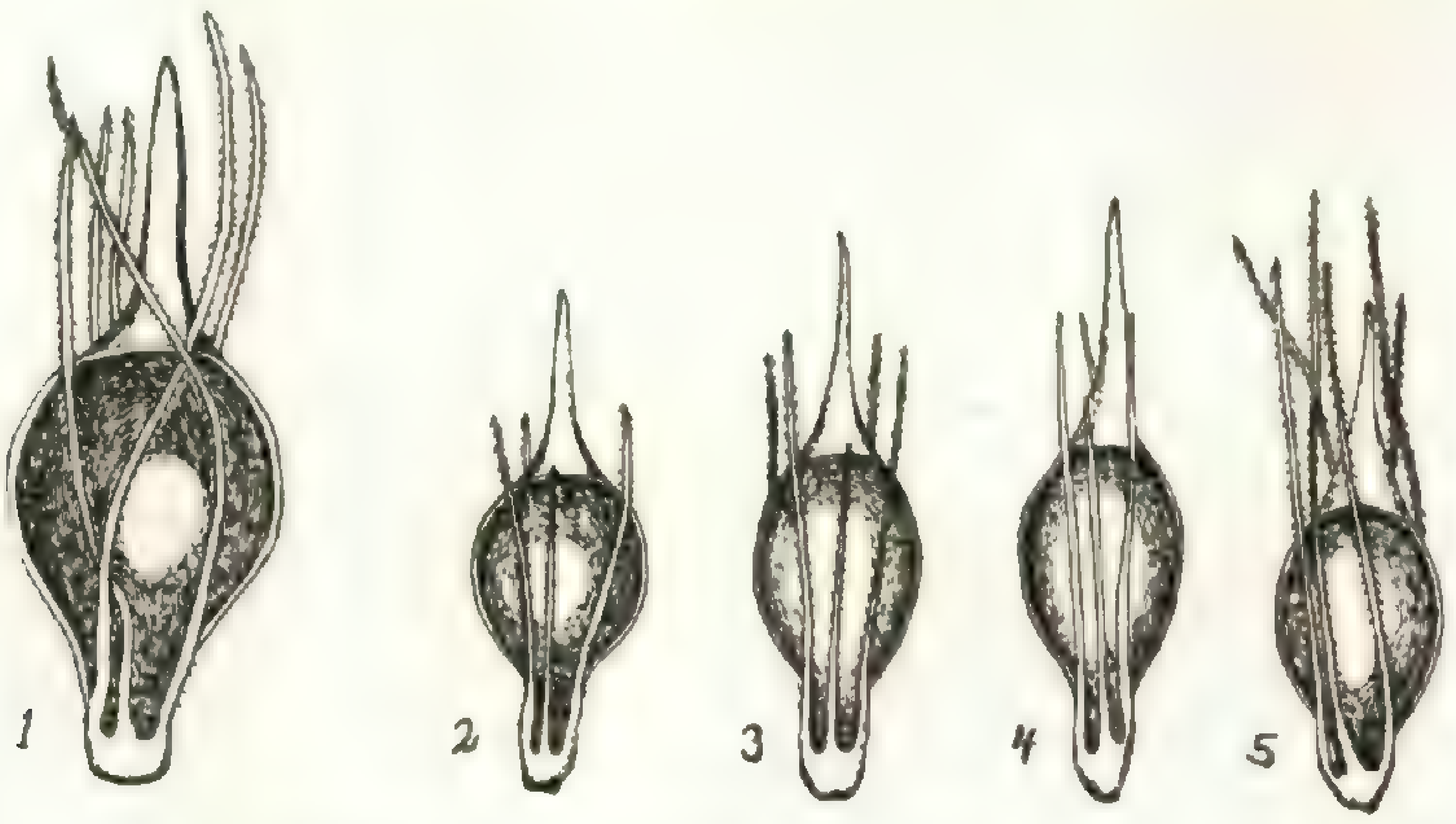
Rynchospora capitellata is a somewhat variable species. The great bulk of the material examined, from Maine and Ontario to Florida and Missouri, has the bristles of the perianth densely and retrorsely barbed. For this, the typical form of the species, the earliest varietal name is *R. glomerata* var. *minor* Britton, based on starved and depauperate specimens from the White Mountains not otherwise differing from the typical form of the species. Another plant, collected by E. B. Bartram in Pennsylvania and by Shull in Maryland, is peculiar in its upwardly barbed bristles. Two sheets, from North Carolina and Indiana, represent the *R. glomerata* var. *discutiens* of C. B. Clarke, characterized by its smooth bristles. All three of these forms have the achene contracted into a rather long stipitiform base. In the *R. glomerata* var. *leptocarpa* of Chapman, from Virginia to Florida

and Mississippi, the achene is provided with a much shorter and more abrupt base. These forms may be defined as follows.

Rynchospora capitellata (Michx.) Vahl var. **minor** (Britton) (typical form).— *Rynchospora glomerata* var. *minor* Britton! Trans. N. Y. Acad. Sci. xi. 89 (1892), also as Contr. Columb. Coll. No. 26. 15.— Aristae retrorsum barbatae.— The common form, from Me. and Ont. to Fla. and Mo.— Fig. 2.

Var. **controversa.**— Aristae prorsum barbatae.— Pennsylvania: moist meadow, Frazer, Chester Co., 14 Aug. 1910, *E. B. Bartram* 1129 in part (type in Gray Herb.). Maryland: on bank, south of Havre de Grâce Park, Chesapeake Bay region, 28 July 1902, *G. H. Shull* 129.— Fig. 3.

Var. **discutiens** (Clarke).— *Rynchospora glomerata* var. *discutiens*



Figs. 1–5.— Fig. 1. *Rynchospora glomerata* (L.) Vahl (*Curtiss* 5739, Florida). Fig. 2. *R. capitellata* (Michx.) Vahl var. *minor* (Britton) Blake (*Gray, N. Am. Gram. &c. Exs. 94*). Fig. 3. *R. capitellata* var. *controversa* Blake (*Bartram* 1129 p. p.). Fig. 4. *R. capitellata* var. *discutiens* (Clarke) Blake (*Buckley*). Fig. 5. *R. capitellata* var. *leptocarpa* (Chapm.) Blake (*Curtiss* 5926).— All × 10.

Clarke! in Britton, Trans. N. Y. Acad. Sci. xi. 89 (1892).— Aristae laeves vel ut dicitur apice barbatae.— North Carolina: mountains, *Buckley* (cotype coll.). Indiana: sterile damp places, Millers, 28 Aug. 1908, *L. M. Umbach* (in A. Kneucker, Cyp. &c. Exsicc. no. 184).— Fig. 4.

Var. **leptocarpa** (Chapm.)— *Rynchospora glomerata* var. *leptocarpa* Chapm. in Britton, Trans. N. Y. Acad. Sci. xi. 88 (1892).— Achenium breve basi abrupte breviterque stipitatum; aristae retrorsum barbatae.— South Carolina: Aiken, July 1866, *Ravenel*. Florida: near De Funick Springs, 6 July 1897, *Curtiss* 5926. Mississippi: Saratoga, 3 Aug. 1903, *Tracy* 8616.— Fig. 5.

The achene of *R. glomerata* (L.) Vahl (*R. paniculata* Gray) is shown for comparison in fig. 1.

(To be continued.)

Gray Herbarium.

SOME AMERICAN EPILOBIUMS OF THE SECTION LYSIMACHION.

M. L. Fernald.

I. AN INSULAR VARIETY OF EPILOBIUM DENSUM.

Epilobium densum Raf., var. **nesophilum,** n. var., caulibus subsimplicibus vel superne ramosis; foliis primariis lanceolatis 3–6 mm. latis; calycibus 4.5–7 mm. longis, lobis obtusis vel obsolete mucronatis; petalis 7.5–10 mm. longis.

Stems subsimple or branching above: leaves lanceolate; the primary 3–6 mm. broad: calyx 4.5–7 mm. long; the lobes obtusish or obscurely mucronate: petals 7.5–10 mm. long.— Newfoundland and the Magdalen Islands. Newfoundland: Bally Haley Bog, St. John's, August 6, 1894, *Robinson & Schrenk;* boggy open woods, Whitbourne, August 8, 1911, *Fernald & Wiegand,* no. 5,913; boggy thickets, Bishop Falls, July 28 and 29, 1911, *Fernald & Wiegand,* no. 5,910. Magdalen Islands: boggy margin of a brackish pond southwest of Étang du Nord Village, Grindstone Island, August 15, 1912, *Fernald, Long & St. John,* no. 7,809; larch swamp, Grindstone, July 23, 1912, *Fernald, Bartram, Long & St. John,* no. 7,813; wet woods and thickets at the border of a larch swamp, Grindstone, August 13, 1912, *Fernald, Long & St. John,* no. 7,816 (type in herb. Gray); dune hollow, Brion Island, August 9, 1914, *St. John,* no. 1,935.

This insular extreme of *Epilobium densum* differs markedly from the typical form of the species, which occurs from the west side of the Gulf of St. Lawrence westward and southward, in its very large flowers and in the unusually broad leaves, as well as in the less branched habit. In true *E. densum* of the continent and of Prince Edward Island the leaves are commonly narrower, the plant ordinarily more bushy-branched and the calyx 3–4.3 mm. long, the petals 4.2–6.5 mm. long. In the subsimple habit and broad leaves, as well as in the larger flowers, *E. densum,* var. *nesophilum* strongly simulates some forms of *E. palustre,* but it has the erect buds and the seeds as well as the closely canescent upper surfaces of the leaves of the more southern species. The calyx-lobes are, in their barely mucronate tips, intermediate between those of the two species, the calyx-lobes of *E. densum* being usually definitely mucronate, those of *E. palustre* merely blunt. In view of the very extensive collections made upon the Magdalen Islands and Newfoundland and the fact that no typical *E. densum* has been

found in either of these insular areas, it is not probable that the somewhat intermediate plant which simulates *E. palustre* but has the technical characteristics of *E. densum* can be treated as of hybrid origin. It seems rather to be an insular variant derived, like so many plants of the Magdalen Islands and Newfoundland, from the south but by long isolation modified into a well pronounced geographic variety.

II. THE SABLE ISLAND EPILOBIUM.

The only *Epilobium* known from Sable Island, 100 miles off the coast of Nova Scotia, is a plant collected in 1899 by Professor John Macoun and in 1913 secured in quantity by Dr. Harold St. John; and from the observations of both these explorers apparently the only member of the genus on the island. The plant in habit, outline of foliage, and large flowers, as well as in the characters of its calyx and seeds, exactly matches the common *E. molle* Torr. of the mainland, while the capsules have the peculiar glandular pubescence which is found upon the capsules of *E. molle,* but in the Sable Island plant much more highly developed than is common in mainland specimens. The stems and the leaves of the Sable Island plant, however, are densely cinereous with appressed and incurved hairs, exactly as in *E. densum* Raf.; *E. molle* having the stems, leaves, etc., densely covered with fine, straight and conspicuously spreading pubescence.

This Sable Island plant with the technical characters of calyx, petals, etc., and the glandular pubescence of the capsule, and the exact habit and leaf-outline of *E. molle,* but with the pubescence of the leaves and stems exactly as in *E. densum* would, if found upon the mainland, be promptly called a hybrid between those two species. But neither of the species has been detected on Sable Island, a region of sufficiently limited area to give assurance that the extended explorations of Macoun in 1899, of Güssow in 1911, and of St. John in 1913, when the latter explorer spent four weeks in an intensive study of the flora, would have brought to light any other existing member of the genus. Upon Sable Island, then, this plant, combining the characters of two ordinarily distinct species of the mainland, cannot be accepted as a hybrid, at least of modern origin. There is, moreover, reason to believe that the flora of Sable Island reached that area during the late Pleistocene and has been isolated from the mainland flora since that time. However long this period may have been, whether estimated

by thousands or tens of thousands of years, it has certainly been a sufficient time for the Sable Island plant to have become thoroughly fixed in its characters, and even if, many thousands of years ago, it may have originated as a hybrid, it has upon Sable Island intensified its characters and become a thoroughly constant plant.

The case of this plant is exactly comparable with that of *E. densum*, var. *nesophilum*, discussed in this paper, the peculiar variant of *E. densum* found upon Newfoundland and the Magdalen Islands, where no true *E. densum* is found, but in those areas suggesting that it might have originated in the long-distant past by the hybridization of *E. densum* of the South and *E. palustre* of the North. Whether these plants have had such an origin is entirely problematical and it may as confidently be argued that they are local developments, which by insular isolation have become fixed entities, and are really the result of natural selection. Whatever the origin of these plants may be, they are now absolutely definite and consistent, and the Sable Island plant is here proposed as

E. MOLLE Torr., var. **sabulonense**, n. var., habitu foliisque ut apud formam typicam; caulibus foliisque dense cinereo-pilosis, pilis adpressis incurvatis; capsulis cinereo-pilosis valde glandulosis.

Habit and foliage as in the typical form: stems and leaves densely cinereous-pilose with appressed incurved hairs: capsules cinereous-pilose, copiously glandular.— NOVA SCOTIA: swampy edge of fresh water pond at Life Saving Station No. 3, Sable Island, September 9, 1913, *Harold St. John*, no. 1282 (TYPE in Gray Herb.); Dr. St. John has examined material collected at the same station in 1899 by *Prof. John Macoun* (no. 21,189).

III. EPILOBIUM GLANDULOSUM AND E. ADENOCAULON.

Epilobium glandulosum Lehm.[1] has long been a somewhat baffling species to interpret, chiefly because of the small amount of material in American herbaria. Haussknecht [2] in his Monograph took up this species and recognized it from the Bering Sea region southward to California and New Mexico and southwestward to Japan, also from Labrador, Newfoundland and Quebec and the Carolina Mountains. Trelease [3] restricted the species to Alaska and northwestern Asia but said "Forms too near this also in British Columbia" and "young specimens

[1] Lehm. Pug. ii. 14 (1830); Hook. Fl. Bor.-Am. i. 206 (1833).
[2] Haussk. Mon. Gatt. Epil. 273 (1884).
[3] Trelease, Mo. Bot. Gard. 2nd. Ann. Rep. 99 (1891).

doubtfully referred here occur in the Gray Herbarium from Labrador." Subsequent authors have been inclined to treat *E. glandulosum* as an obscure plant and not to recognize it as a broadly distributed northern species. In the meantime the vast accumulations of *Epilobium* of the general affinity with *E. glandulosum* have found their way chiefly into the covers of *E. adenocaulon* Haussk.[1]

About the Gulf of St. Lawrence and on the shores of the Straits of Belle Isle and the coast of eastern Labrador there is a large-flowered *Epilobium* with petals 7–9 mm. long, the pubescence as in *E. adenocaulon*, the leaves of similar outline, but much more crowded, and not conspicuously decreasing in size into the inflorescence. The stem is comparatively simple, the branches being few and very short. This plant, long familiar to the writer from the coast of the Gaspé Peninsula of Quebec, the Straits of Belle Isle and Newfoundland, exactly matches the Alaskan material of undoubted *E. glandulosum*, as well as the plate of that species published by Léveillé.[2] In the Gulf of St. Lawrence region, however, many plants occur with the lax habit and more reduced upper leaves of *E. adenocaulon*, but with the flowers quite as large as in *E. glandulosum*, while other specimens with the habit of *E. glandulosum* have the smaller flowers of *E. adenocaulon*. That the two species there freely intergrade cannot be questioned; but it is significant that all the material from the colder habitats, the Labrador coast, the outer coast of Gaspé, etc., are fairly consistent and perfectly characteristic *E. glandulosum*. Reference has already been made to Prof. Trelease's statement that in the Northwest forms in British Columbia are "too near" *E. glandulosum*. Herbarium material shows that this is certainly the case and that in the Northwest as well as in the Northeast the two are confluent. Examination of the seeds of characteristic material of both plants fails to reveal any distinctive character, although the seed of *E. glandulosum* is very slightly longer than that of *E. adenocaulon*.

On the whole, the writer is forced to the conclusion that these plants should be treated as one species, a conclusion already suggested by Dr. Britton, who treats *E. glandulosum* as doubtfully distinct from *E. adenocaulon*.[3] As geographic varieties, however, the plants are well pronounced and their treatment as such seems to the writer

[1] Haussk. Oesterr. Bot. Zeitschr. xxix. 119 (1879).
[2] Léveillé, Icon. Gen. Epil. t. 164 (1910).
[3] Britton in Britton & Brown, Ill. Fl. ii. 484 (1897).

more satisfactory than to attempt to keep them apart as species on inconstant characters.

The plant which has passed as *E. adenocaulon* is extremely variable and the two varieties proposed by Prof. Trelease are fairly pronounced. The most extreme of these is his var. *perplexans,* in which the leaves are narrowed gradually to slender petioles. This plant often looks like a thoroughly distinct species but it has no constant characters by which it can be clearly separated. It is found locally from Newfoundland across the continent to Washington and southward across New England and New York, and in the Rocky Mountains to Colorado. The other variety, var. *occidentale,* is in some ways less pronounced but in its narrow lanceolate stem-leaves is fairly recognizable as distinct from true *E. adenocaulon,* in which the median leaves are from narrowly ovate to ovate-lanceolate. This variety is not confined to western America, however, but extends eastward to Ontario and northern New York and is also found, like many other northwestern plants, about the Gulf of St. Lawrence, in northern New England and in Newfoundland. Its lanceolate leaves somewhat suggest those of *E. coloratum,* but the coma of the fruit is quite white instead of cinnamon-colored as in the latter species, and it has the characteristic seed of *E. glandulosum.* Flowering material has been much confused with *E. coloratum,* as indicated by the labels; but the fully grown bud of *E. coloratum* has uncinate short tips (the appendages of the calyx-lobes), while the buds and calyx-lobes of *E. glandulosum* are blunt.

Two other extreme variations of *Epilobium glandulosum* occur in Labrador, Newfoundland and eastern Quebec. The more widely spread of these is a plant of southern Labrador, Newfoundland and the Gaspé Peninsula with the tall habit, loose inflorescences and reduced bracteal leaves of *E. adenocaulon* but with the middle cauline leaves cordate-attenuate, the base being conspicuously cordate. This may prove to be *E. boreale* Haussk., described from plants raised at Berlin from Alaskan seeds, a species not well understood by American botanists. The illustration published by Léveillé [1] of the summit of a specimen at Berlin strongly suggests the summit of the Labrador, Newfoundland and Gaspé plant; but in his original description Haussknecht clearly described the median cauline leaves as being "basi

[1] Léveillé, Icon. Gen. Epil. pl. 162 (1910).

subrotundatis brevissime petiolatis, oblongo-lanceolatis acutis."[1] This description would hardly have been given for the median leaves of the northeastern plant, which, as stated, are conspicuously cordate; and the plant is therefore here proposed as a new variety of *E. glandulosum.*

The other unique variant from the Gulf of St. Lawrence region is the plant of Brion Island, the outermost of the Magdalen Islands. In this variation the leaves are very unlike those of the variety just discussed as also the other described varieties, in all of which the leaves taper to an acute to acuminate apex. In the Brion Island plant, however, the median leaves are elliptic-oblong to oblong-lanceolate and rounded at summit; but in its essential characters, of seeds, pubescence, and habit the plant belongs with *E. glandulosum* and *E. adenocaulon.*

Briefly summarized the varieties of *E. glandulosum* may be characterized as follows:

A. Flowers 6–9 mm. long: leaves crowded, not conspicuously decreasing in size into the crowded inflorescence . . . . Var. *typicum.*
A. Flowers 4–8 mm. long: leaves remote, conspicuously decreasing in size into the loose and open inflorescence. *B.*
  B. Median cauline leaves cordate-attenuate, ovate, conspicuously cordate at base . . . . Var. *cardiophyllum.*
  B. Median leaves ovate-lanceolate to narrowly lanceolate or oblong, rounded, barely subcordate or narrowed at base. *C.*
    C. Leaves firm, rounded or barely subcordate at base, with very short petioles: stems (except in dwarf plants) freely branching, up to 1.3 m. high. *D.*
      D. Leaves narrowly ovate to lanceolate, acuminate or at least acutish.
        Median leaves narrowly ovate or ovate-lanceolate. Var. *adenocaulon.*
        Median leaves elongate-lanceolate . . . . Var. *occidentale.*
      D. Leaves elliptic-oblong to oblong-lanceolate, rounded at summit. Var. *brionense.*
    C. Leaves thin and rather flaccid, tapering at base to the rather slender petiole: stems simple to slightly branching, 0.2–3 (rarely –4.5) dm. high . . . . Var. *perplexans.*

E. glandulosum, var. **typicum.** *E. glandulosum* Lehm. Pugill. ii. 14 (1830); Hook. Fl. Bor.-Am. i. 206 (1833); Haussk. Mon. Gatt. Epil. 273 (1884); Trelease, Mo. Bot. Gard. 2nd. Ann. Rep. 99 (1891); Léveillé, Icon. Gen. Epil. t. 164 (1910). *E. montanum* La Pylaie, Voyage à l'île de Terre Neuve, 78 (1825); Haussk. l. c. 76 (1884) as to Labrador plant, not L.— Coasts of Bering Sea, southward to Japan and Washington and in the mountains to Oregon; coasts of Labrador and Newfoundland, and Saguenay and Gaspé Counties, Quebec.

[1] Haussk. Mon. Gatt. Epil. 279 (1884).

In its large corolla and in its habit var. *typicum* closely simulates the European *E. montanum* L. from which it differs, however, in its shorter-pediceled capsules and its less saliently toothed and less cordate leaves; and it was unquestionably this plant which La Paylaie saw on the shores of Quirpon Island in northeastern Newfoundland and recorded as *E. montanum.* It is also highly probable that this is the plant which forms the basis of Haussknecht's report of *E. montanum* from Nain, Labrador.

E. GLANDULOSUM, var. **cardiophyllum,** n. var., var. adenocaulo habitu simile: foliis intermediis cordato-ovatis attenuatis basi valde cordatis 6–10 cm. longis 2.5–4 cm. latis; floribus 5–8 mm. longis.

Similar in habit to var. *adenocaulon:* median leaves cordate-ovate, attenuate, conspicuously cordate at base, 6–10 cm. long, 2.5–4 cm. wide: flowers 5–8 mm. long.— LABRADOR: limestone and calcareous sandstone terraces, Blanc Sablon, August 6, 1910, *Fernald & Wiegand,* no. 3731. NEWFOUNDLAND: rocky banks of Rennie's River, St. John's, August 4, 1894, *Robinson & Schrenk,* no. 195; sandy and gravelly banks of Waterford River between Waterford Bridge and St. John's, August 2, 1911, *Fernald & Wiegand,* no. 5926; wood-road, Port Saunders, August, 1910, *Fernald, Wiegand & Kittredge,* no. 3732; calcareous talus, bank of Humber River, between Mt. Musgrave and Humber Mouth, July 18, 1910, *Fernald, Wiegand & Kittredge,* no. 3729. QUEBEC: coniferous forest, "Low's Trail," from the Forks of the River Ste. Anne des Monts to Table-top Mountain, July 31, 1906, *Fernald & Collins,* no. 661 (TYPE in Gray Herb.).

E. GLANDULOSUM, var. **adenocaulon** (Haussk.), n. comb. *E. adenocaulon* Haussk. Oesterr. Bot. Zeitschr. xxix. 119 (1879).

E. **glandulosum,** var. **occidentale** (Trelease), n. comb. *E. adenocaulon,* var. *occidentale* Trelease, Mo. Bot. Gard. 2nd. Ann. Rep. 95 (1891). *E. occidentale* Rydberg, Mem. N. Y. Bot. Gard. i. 275 (1900).

E. GLANDULOSUM, var. **perplexans** (Trelease), n. comb. *E. adenocaulon,* var. ? *perplexans* Trelease l. c. 96 (1891). *E. perplexans* Coult. & Nels. Man. Bot. Rocky Mts. 337 (1909).

E. GLANDULOSUM, var. **brionense,** n. var., var. adenocaulo habitu simile; caulibus 3–4 dm. altis simplicibus vel ramosis: foliis primariis elliptico-oblongis vel oblongo-lanceolatis apice basique rotundatis subsessilibus 3–4.5 cm. longis 1.1–1.6 cm. latis; floribus 7 mm. longis.

Similar in habit to var. *adenocaulon:* stems 3–4 dm. high, simple or branching: primary leaves elliptic-oblong or oblong-lanceolate, rounded to base and apex, subsessile, 3–4.5 cm. long, 1.1–1.6 cm. wide: flowers 7 mm. long.— MAGDALEN ISLANDS: edge of pond in sand dunes, Brion Island, August 6, 1914, *Harold St. John,* no. 1938 (TYPE in Gray Herb.).

IV. EPILOBIUM ALPINUM AND ITS ALLIES IN NORTHEASTERN AMERICA.

The name *Epilobium alpinum* has been so variously used that by some authors, such as Haussknecht, it has been felt wise to discard it entirely as a source of perpetual confusion. Trelease,[1] however, because of the presence among the mixed specimens called *E. alpinum* in the Linnean herbarium of typical *E. lactiflorum* Hausskn., felt that the doctrine of residues should be applied and that, all the other elements of the mixed Linnean species having been long ago removed, the residual *E. lactiflorum* should be called *E. alpinum*. On the other hand, Mr. A. H. Moore [2] has recently argued at length that the name *E. alpinum* must be applied to *E. Hornemanni* Reichenbach. Mr. Moore makes at least a fairly clear point that *E. alpinum* rested upon plants with pink flowers, and it is certainly reasonably definite that Linnaeus had in mind both the pink-flowered plants subsequently described as *E. anagallidifolium* Lam. and *E. alsinefolium* Vill. But the remainder of Moore's argument, that *E. Hornemanni* Reichenb. must be called *E. alpinum,* is less convincing and in view, of the great difficulty of this question and the lack of finality in some of Moore's arguments, it does not seem wise to drop the definite name *E. Hornemanni* and to take up for it the obscure and variously interpreted name, *E. alpinum*. *E. Hornemanni* is an arctic-alpine species known in Europe only from Norway and Sweden. Yet Moore urges that it is the true Linnean *E. alpinum,* and supports his argument in part by stating that "this was apparently the older view," citing in his evidence "Sowerby's English Botany, xxvii. pl. 2001 (1819), for example." In citing Sowerby's plate of *E. alpinum* as representing *E. Hornemanni,* Moore, however, apparently overlooks the pertinent fact that *E. Hornemanni* is unknown from Great Britain. He also infers that Haller's *Epilobium foliis ellipticis, obtuse lanceolatis* from Switzerland is *E. Hornemanni;* in this inference also failing to give great weight to the fact that *E. Hornemanni* does not occur south of Scandinavia. For similar reasons Scheuchzer's *Chamaenerium alpinum alsines foliis* from Switzerland, the reference given by Linnaeus from which the name-bringing adjective *alpinum* seems to have been derived, cannot be identified with the Scandinavian *E. Hornemanni.*

[1] Trel., Mo. Bot. Gard. 2d Ann. Rep. 108 (1891).
[2] Rhodora, xi. 144–147 (1909).

The overwhelming weight of opinion among post-Linnean botanists has been that the name *E. alpinum* belongs properly to *E. anagallidifolium* Lam. Haussknecht cites no less than 125 European authors who have so treated the plant, and, since Haussknecht's own work, such critical students of the European flora as Britten & Rendle and Druce have clearly designated *E. alpinum* as signifying *E. anagallidifolium.* In view of this great weight of authoritative usage and the difficulty of proving clearly that the name *E. alpinum* applies more definitely to any other plant, we may well retain it in its long established sense for *E. anagallidifolium,* thus subscribing to one of the general principles (Art. v.) of the International Rules of Botanical Nomenclature that "when the consequences of rules are doubtful, established custom becomes law."

Moore, in the same paper in which he would identify *E. Hornemanni* as the Linnean *E. alpinum,* states that the seeds of *E. Hornemanni* and *E. lactiflorum* "do not differ in any respect" (p. 142), arguing that Haussknecht could not have seen the seeds correctly. Nevertheless, examination of seeds from every mature sheet in the Gray Herbarium of these species shows conclusively that when seen against strong illumination the margin of the seed of *E. lactiflorum* appears very regular and smooth while the profile of the seed of *E. Hornemanni* is distinctly pebbled or, as Haussknecht says, "papillose." Only in the very rarest instances, and then in regions where both species abound, has there been any question in placing the plants in two definite species, one with the seeds smooth, the other with pebbled seeds. Furthermore, all the material from Scandinavia, Greenland, Arctic America, and the region southward to the Shickshock Mountains and the White Mountains with the smooth seed of *E. lactiflorum* has the petals distinctly milk-white, as described by Haussknecht, or at most with a tinge of light pink, and in all these plants the expanded flowers (in dried condition) measure 3–5 (very rarely –6) mm. long. On the other hand, the material of *E. Hornemanni,* the species with pebbled seeds, has the expanded flowers 5–10 mm. long, the petals (except in rare albinos) lilac to rose-purple. The writer is therefore constrained to regard the two, as was done by Haussknecht, by Trelease, and by numerous later students, as clearly distinct species and not, as Moore argues, merely color forms with no other differences except the color of the petals.

Besides *E. alpinum* (*E. anagallidifolium*), which occurs southward to

the Shickshock Mountains of Quebec and apparently to Mt. Katahdin, Maine (specimens young), *E. Hornemanni* and *E. lactiflorum*, there is in eastern America one other clearly marked species which seems not to have been described. This is a plant occurring in the Torngat Mountain region of northeastern Labrador and represented in the Gray Herbarium by two collections made by the Rev. Adolph Stecker of the *Unitas Fratrum*. This plant of the Torngat Mountain area has the cespitose habit of the other species, but is more stiffly erect and with sub-coriaceous or almost rigid, crowded sessile leaves, these occurring as 9–12 pairs below the lowest flower; the other species of eastern America having the 3–7 pairs of thin foliage leaves distinctly petioled. The flowers are small, with whitish petals, as in *E. lactiflorum*, but the young buds and young capsules are strictly erect instead of nodding, as in that and in the other related species; while the capsule is very short-pedicelled, the pedicel only 2–4 mm. long, *E. lactiflorum*, having the pedicels well developed, often 2 or 3 cm. long, as do both *E. Hornemanni* and *E. alpinum*. The mature capsules of the new plant are 3.5–4 cm. long, those of *E. lactiflorum* and of *E. Hornemanni* being usually longer (3–6 cm.). The seed is essentially that of *E. Hornemanni*, being fusiform and with a pebbled surface. In its stiff habit and crowded leaves the new plant resembles *E. Bongardi* Haussk. of the Bering Sea region, but the latter species has more oval leaves, much larger flowers (6–10 mm. long) with conspicuous crimson petals, the capsules are long-pedicelled (often 2 cm. long), and the seed is quite smooth, as in *E. lactiflorum*.

The Labrador plant, differing in its essential characters from all the described northern species, may appropriately bear the name of the assiduous collector, Rev. Adolph Stecker, who has supplied us with material of so many interesting and often novel plants from northeastern Labrador. The species is therefore described as

Epilobium **Steckerianum**, n. sp., E. lactifloro habitu floreque simile; caulibus stricte erectis; foliis subcoriaceis confertis 9–12 jugis infra inflorescentiam oblongo-lanceolatis 1.5–3.5 cm. longis 0.5–1 cm. latis obtusis repando-denticulatis sessilibus vel subsessilibus; floribus 4–6, virgineis erectis 4.5–5.5 mm. longis; calycibus 3.5–5 mm. longis glabratis; petalis lacteis; capsulis breviter pedicellatis, junioribus erectis glanduloso-hirtellis, adultis glabratis 3.5–4 cm. longis, pedicellis 2–4 mm. longis; seminibus fusiformibus, apice in appendiculum pellucidum productis 1.3 mm. longis 0.4 mm. latis, testa papilloso-rugulosis.

Similar to *E. lactiflorum* in habit and flowers, but stiffly erect: the

leaves subcoriaceous, crowded, 9–12 pairs below the inflorescence (members of the upper pairs sometimes disjoined), oblong-lanceolate, 1.5–3.5 cm. long, 0.5–1 cm. broad, obtuse, repand-denticulate, sessile or subsessile: flowers 4–6; the young erect, 4.5–5.5 mm. long: calyx 3.5–5 mm. long, glabrate: petals milk-white: capsules short-pedicelled; the young erect, glandular-hirtellous; the mature glabrate, 3.5–4 cm. long; pedicels 2–4 mm. long: seeds fusiform, produced at apex into a pellucid appendage, 1.3 mm. long, 0.4 mm. broad; the testa papillose-rugulose.— LABRADOR: Rama, July 15–August 20, 1894, *A. Stecker*, no. 90, distributed as *E. Hornemanni;* Rama, July–August, 1899, *A. Stecker*, no. 360 (TYPE in Gray Herb.), distributed as *E. Hornemanni.*

GRAY HERBARIUM.

NUTTALL AND PICKERING IN THE WHITE MOUNTAINS.— In a recent article on early botanical explorations in the White Mountains[1] I stated that the date of Mr. Nuttall's visit to the White Mountains was not known, but suggested that it may have fallen between the years 1822 and 1824. This trip was of significance because upon it, according to Tuckerman,[2] "the practised eye of Mr. Nuttall had detected several species, of such rarity, that few have seen them since." But after the article in *Appalachia* was published, Dr. Frederick Tuckerman examined the old hotel-register or 'visitors' album' of Ethan Crawford,[3] and he has kindly communicated to me this entry under date of 12 August, 1824: "Thos. Nuttall
Jas. Whitfield
Cambridge,
Mass."

The collections of Charles Pickering on Mt. Washington in 1825 are amply attested,[4] but evidence was hitherto lacking for any subsequent visit by him. The same register, however, records the names of Oakes and Pickering on 18 July and of Pickering again on 22 July, without mention of the year. But since the preceding page of the register is dated 1827 that is probably the date of this trip.— ARTHUR STANLEY PEASE, Urbana, Illinois.

[1] *Appalachia* 14 (1917), 167.
[2] In T. S. King's *White Hills*, 1st ed. (1860), 46.
[3] Now in the possession of his only surviving child, Mr. W. H. Crawford, of Jefferson, N. H.
[4] *Appalachia* 14 (1917), 166.

A further Note on the Lichens of Nantucket.— I spent last summer from June 25 to August 7, 1917, at Nantucket, Mass., and during my stay collected the following species of lichens additional to those included in my two previous lists (Rhodora **14**: 88–90. 1912. & **15**: 93–94. 1913).

Usnea plicata (L.) Web. Depauperate on fence rails.

Ramalina fasciata (Pers.) Ach. emend. On trees.

Cetraria tenuifolia (Retz.) Howe. One station.

Physcia stellaris (L.) Nyl. On locusts.

Nephromopsis ciliaris (Ach.) Hue. On old fence rails.

Parmeliopsis aleurites (Ach.) Nyl. On old fence rails.

Lecanora varia (Ehrh.) Nyl. On trees.

Specimens of most of the species known from this island are now on exhibition in the rooms of the Maria Mitchell Association.— R. Heber Howe, Jr., Thoreau Museum, Concord, Massachusetts.

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Rhodora

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HISTORY OF THE AMERICAN RECORD OF SCIRPUS MUCRONATUS.

BAYARD LONG.

IN an article by Dr. N. L. Britton, entitled *New or Noteworthy North American Phanerogams*, published in 1888,[1] there appears the note: "*Scirpus mucronatus*, L. This Old World species was collected over twenty years ago in Delaware County, Penn., by Mr. C. E. Smith and Dr. George Smith, and appears to have since lain unnoticed in our herbarium, which is to a certain degree my own fault, for there is a specimen in the Torrey Herbarium dating back to 1864. . . ."

This record was carried forward in 1890 in Watson and Coulter's edition of Gray's *Manual* where the species is credited to "a single locality in Delaware Co., Penn."; also in 1896 in Britton and Brown's *Illustrated Flora* — "In a swamp in Delaware County, Pennsylvania"— and in 1901 in Britton's *Manual*. In 1903 in Porter's *Flora of Pennsylvania* the species was recorded from an additional county — Chester. In Keller and Brown's *Flora of Philadelphia and Vicinity* in 1905 the original station in Delaware County was more definitely noted as Rhoads' Swamp, on the authority of Benjamin H. Smith, and the new record from Chester County was copied from Porter. In the second edition of Britton's *Manual* of 1905 and in the third edition of two years later the record stood as in the *Manual* of 1901. In Linnaeus Fussell's *List of Delaware County Plants*, published in the Proceedings of the Delaware County Institute of Science in 1906, the plant received a recognized place in the flora, without comment. In

[1] Britton, Bull. Torr. Bot. Cl. xv. 103 (1888).

Gray's New Manual of 1908 the species was taken over, unchanged, except in a few details of description, from Watson and Coulter's edition; in the new edition of the *Illustrated Flora* there was no change from the first edition. In the latest publication where the species is cited, Norman Taylor's *Flora of the Vicinity of New York*, the occurrence is summarized thus: "Known in N. Am. only from a swamp in Delaware Co., Pa. and as reported also from Chester Co."

Our American sedge flora is so characteristically made up of indigenous species that there is a rather added attraction in introductions in this group. Probably no sedge, of the comparatively few foreign species accredited to this country, is less well known to American collectors than *Scirpus mucronatus;* yet for more than twenty-five years it has been a familiar name in all our manuals of the plants of the northeastern United States, nor has it ever failed to receive a place in various local floras covering southeastern Pennsylvania. Furthermore it has been over fifty years since this plant was first collected and almost equally long apparently since it was brought to the attention of the foremost botanists of the United States. But the point of chiefest interest to be noted is that all the material, with apparently a single exception, dates from the year of the original discovery, or a very few years later.

It will be recalled that species, especially introductions, which hold places in our manuals and floras upon the basis of old collections or records, coupled with little or no present day evidence, ofttimes prove to be worthy of critical attention. The reputed occurrence in America of *Scirpus mucronatus* is a case in point.

Unsatisfactory results, in investigating questionable records, seem to be the general rule: sometimes, in the absence of a substantiating specimen, an expression of opinion is the best that can be done; at other times even an apparently verifying specimen may leave one unconvinced. A specimen which solves the problem suggested by a record is unhappily none too common, but fortunately in the present case the evidence is clear and, moreover, ample.

The early history of this record to be gleaned from labels and notes accompanying the original specimens proves to be rather interesting, at least from a human standpoint, in showing through what vicissitudes a debatable record may pass. That, in its later history, in a succeeding generation of botanists, it may still rise to full credence and become traditionally authentic, is no less interesting as a human document.

For a long time there has been in the collection of the Philadelphia Botanical Club a specimen collected by Charles E. Smith in 1864 originally bearing the name "Scirpus mucronatus" and in a nearby corner of the label "fide Gray." At some later time the word "mucronatus" had been heavily crossed through and "debilis" written above. The locality, often so accurately designated by Smith is merely "(Del. Co.)." There is a single plant on the sheet of what appeared to be a rather immature, very ordinary-looking *Scirpus debilis*, with still erect involucral leaf. This specimen had failed to be definitely associated with the *mucronatus* record, in the absence of scepticism and especial interest. The copious notes often accompanying the C. E. Smith plants frequently bear critical comments by several botanists on the identity of the specimens, and often many changes of names. It was thus very easy to overlook this sheet on the presumption that there had been a mere casual misidentification.

Several years ago when a series of duplicates from the Aubrey H. Smith Herbarium was being obtained from the University of Pennsylvania specimens were secured bearing the label data: "Scirpus mucronatus L., Rhoads Swamp, Marple, Del. Co." There were a number of plants and loose culms, rather robust, and one almost 6 dm. tall, but in no manner, upon casual examination, differing from well developed *Scirpus debilis*. With the examination of this material an interest — and a suspicion — arose. A glance into Keller and Brown showed that while *Scirpus mucronatus* was recorded from Rhoads' Swamp on authority of Mr. Benjamin Smith, from exactly the same locality *S. debilis* was reported by Dr. Linnaeus Fussell!

Although all manual and flora references to this "Scirpus mucronatus" in Pennsylvania tacitly accepted it as a probable introduction from Europe, an interesting premonition of its true character is to be seen in an opinion originally voiced by Dr. Britton in his note, and no doubt suggested by C. E. Smith. "Mr. Smith has sent me the following note on the locality: 'It is in a small patch of *Sphagnum* in a field, 300 feet above tide water'," Dr. Britton quotes, and then says, "Mr. Martindale has it from the ballast grounds at Camden, but there seems no doubt that the Delaware County plant is a native."

The Porter Herbarium, with its wealth of Pennsylvania material, had only recently come to the Philadelphia Academy, and but little of it had yet been removed from the original covers and mounted. In the species cover of "Scirpus mucronatus" were found three sheets

of specimens bearing pertinently upon the records of this species. One sheet of two rather robust plants had been received from Dr. George Smith, as collected by himself in Delaware County, Pennsylvania in 1867. The label, in his own hand, reads "Scirpus debilis Pursh." This identification has been crossed out and in the hand of Dr. Britton has been written above, and initialed, "mucronatus, L. N. L. B." A second sheet contains several robust fruiting culms stuck through a slit label, bearing in C. E. Smith's hand the data: "Scirpus mucronatus, Del. Co., Pa." At the bottom of the label Porter has written, "A robust specimen of *Scirpus debilis*. T. C. P." and "mucronatus" has been crossed through. The third specimen consists of a rather robust clump in ripe fruit accompanied by Porter's label: "Scirpus debilis Pursh, Lincoln, Chester Co., Pa., Sept. 6, 1887." There seems to have been, first, a "?" pencilled after the determination, then "mucronatus?" written in pencil below the original name, and finally "mucronatus L." inked in ! Except for the rather noticeable robustness of these Porter plants they appeared to differ in no way from *Scirpus debilis*, and even in stature they were well within recognized limits of the species.

Examination of the Eurasian material of *Scirpus mucronatus* in the Academy Herbarium, the perusal of descriptions and following of keys in several European treatments was soon quite convincing that, although superficially somewhat resembling our American *S. debilis*, in technical characters this was a very different plant.

The Smiths — Charles, George and Aubrey — as well as a number of other Philadelphia botanists of their time were all closely associated, commonly collected specimens in duplicate and exchanged copiously. From former experience with records from these collectors it was felt that there would be within easy reach and personal examination in Philadelphia a still further series of specimens no doubt similar to the material at New York upon which Dr. Britton had based his record.

In the search for material verifying old records from the Philadelphia area the Herbarium of the University of Pennsylvania is one of the sources of first appeal. In the present case the evidence proved to be exceptionally complete and satisfactory. There are two sheets of plants here from the Aubrey H. Smith Herbarium bearing on the present question. The sheet of chief interest contains two specimens (which may have been one clump): one with about ten well developed culms, the other with two or three, some measuring 6 dm. or more in

height. They are robust plants with heads of about 5–15 spikelets, in ripe fruit. There are three tickets attached to this sheet, two of which are of interest. What is apparently the original collection label reads: "Scirpus mucronatus, Rhodes Swamp, Springfield, Del. Co., Sept. 18, 1864. Leidy, C. E. Smith, Geo. Smith, A. H. Smith, testes." This is written in a light ink in the hand of Aubrey Smith. In an upper corner of this ticket is pencilled "Gray says it is S. muc. Torrey says the same." Under which is written in a dark ink "(They are in error. A. H. S. Apr. 20, '68)" and under "Scirpus mucronatus" in the same dark ink appears inserted "This is S. debilis, Pursh. A. H. S." The second ticket is a long, critical note on the comparative characters of "the European plant" and "the American," in the characteristic hand and form of Charles E. Smith. There are sixteen lines of comparative description, in which he says, in small part, "The culm and involucre of our plant are slender . . . . and nearly terete — those of the European are stout, triangular." At the foot of the note he also has affirmed his conviction — "Scirpus debilis, Pursh. Not S. mucronatus." The other sheet bears a label in Aubrey Smith's hand, "Scirpus debilis, Rhodes Swamp, Del. Co." and a note, "This plant differs much from the plant usually called by this name — it is much stouter with more numerous spikes — has few or no leaves and has the involucre bent to one side." His description accurately fits the robust plant on the sheet, and his idea of characteristic *debilis* is readily explained, for the most part, by the other specimens he had — material from Upper Darby and from Lancaster County being of plants much smaller and more slender, with heads of fewer spikelets and the involucral leaves mostly erect. (These are not *Scirpus Smithii*, however, which is a quite distinct species.)

The Herbarium of the Delaware County Institute of Science at Media, Pennsylvania contains many valuable specimens bearing on local records. Here there is a sheet of *Scirpus debilis* from Rhoads' Swamp originally bearing the name "Scirpus mucronatus??" Its identity had already been the source of considerable divergence of opinion before it came under my own hand, for its original identification with two interrogation points had been corrected to "debilis," which in its turn had been discredited and "mucronatus" restored.

But despite the apparent conclusiveness of all this Philadelphia evidence, it is not to be forgotten that the record of 1889 technically rests upon the material at New York seen by Dr. Britton. He has

written that this consists of a specimen collected in Delaware County in 1864 by Mr. C. E. Smith, in the Columbia College Herbarium, and a specimen collected by Dr. George Smith in 1867, received through Professor Porter. (These are undoubtedly duplicates of material in the C. E. Smith Herbarium and the Porter Herbarium, respectively.) Dr. Britton has kindly examined these New York specimens very critically and he is agreed that upon the basis of this material *Scirpus mucronatus* must be excluded from the American flora.

In the Gray Herbarium, Prof. Fernald has informed me, upon my inquiry, that no material was to be found under the name "Scirpus mucronatus," but further search in the herbarium finally disclosed a single sheet of C. E. Smith's material representing the record. This is labelled "Delaware County, Aug. 1864" (and is no doubt similar to the specimens at New York and Philadelphia). Critical examination by Prof. Fernald showed absolutely no difference between this material and that of authentic *S. debilis* sent out by Smith in 1865. In the search for this material an interesting fact came to light, in that — quoting from Prof. Fernald's letter — "the sheet long ago had been transferred to the *S. debilis* cover by Dr. Gray, who had marked on the sheet 'S. debilis, true.'"

It would seem that the opinions of Gray and of Torrey must have been obtained by the Philadelphia collectors not long after the discovery of the plant in 1864 — possibly even the same or the following year. There is no indication when C. E. Smith satisfied himself that this plant was *S. debilis* but A. H. Smith, it will be remembered, had dated his like opinion April 20, 1868. It is impossible to say just how soon after 1864 Gray reached this same conclusion — and rectified his former opinion — but there is probably to be seen a real connection between the correct identification of the plant and the fact that "Scirpus mucronatus" is *not* recorded in the 1867 edition of Gray's *Manual.*

How did the plant come to be included by Watson in 1890 in his edition of the *Manual?* — is the question that at once comes to mind. To Prof. Fernald's interest and investigation I am indebted for the information that the copy of the fifth edition which was annotated by Watson when revising the manual, before the publication of Edition 6, contains the note in his own hand, "S. mucronatus, L. See T. B. 15. 103" — which refers to the record in the Bulletin of the Torrey Botanical Club of 1888. This is indicative of Watson having accepted

the plant upon the basis of the published record, without having seen material — the specimen in the cover of *Scirpus debilis* having long before this time become completely dissociated from the "Scirpus mucronatus" collection.[1]

On one of the Charles E. Smith labels is the memo, "See Gray under S. Torreyi." In the first edition of Gray's *Manual* of 1848, and the succeeding early editions, following *Scirpus Torreyi* is the note: "S. mucronatus, L., should it ever be found in the country, will be known by its leafless sheaths, conglomerate head of many spikes, stout involucral leaf bent to one side, &c., &c." — no doubt inserted because of the reference, immediately above, to "S. mucronatus, Pursh? Torr. Fl. N. Y." in the synonymy of *S. Torreyi.* To this somewhat unfortunate note — or rather, perhaps, the unfortunate interpretation of it — is without doubt due the suggestion in the minds of the original collectors that the Rhoads' Swamp plant was to be identified with *Scirpus mucronatus.* Whether the elimination of this note in 1867 from the fifth edition of the *Manual* was owing to a realization of its somewhat misleading character — recognized through the matter of the Smiths' "Scirpus mucronatus" from Delaware County — cannot be asserted positively, but would seem not unlikely. It must certainly have been connected with some radical change of ideas about the species.

The assertion in the latter part of Dr. Britton's note on *Scirpus mucronatus* that "Mr. Martindale has it from the ballast grounds at Camden" was thought worthy of investigation. So many strange plants have been associated with the old ballast grounds that this statement suggested the possibility of a veritable occurrence of this species in America — interesting at least historically. Search in the Martindale Herbarium at the Philadelphia College of Pharmacy showed a specimen bearing the label: "Scirpus debilis Pursh = S. supinus, Ballast, Camden, N. J., June, 1877, Isaac C. Martindale." The identification has been corrected to *S. mucronatus* in the hand of Dr. Britton. The material, a single, whole individual, clean and

[1] For this reason, in the preparation of *Gray's New Manual*, no specimen was found under *S. mucronatus*, the species was left in the status of Watson's treatment, and for want of material remained unillustrated. In connection with illustrations, it may be noted that the line drawing in the two editions of Britton and Brown's *Illustrated Flora* is obviously not an original drawing made from the Delaware County material. It accurately represents *Scirpus mucronatus* L. however, and was doubtless made from Old World material, if not copied from some European source.

excellently prepared, shows a robust plant in mature fruit, with culms very palpably triangular and involucral leaves divergent — *Scirpus mucronatus*, perfectly characteristic in every way.

There is no material of this collection in the Herbarium of the Philadelphia Academy (where there are many Martindale duplicates), at the University of Pennsylvania, or presumably at New York or Cambridge, so it may be safely concluded that this occurrence of *S. mucronatus* at Camden was probably even more casual than the generality of ballast plants — many of which, although persisting only a season or two, at least originally occurred in such numbers of individuals as to be well, if not overly, represented in many herbariums. *Scirpus mucronatus* at Camden may be noted as a matter of historical record, but thus only.

Academy of Natural Sciences of Philadelphia.

NOTES ON THE CLAYTON HERBARIUM.

S. F. Blake.

(*Continued from page 28.*)

4. *Dioscorea villosa* L. Sp. ii. 1033 (1753).[1] In his recent revision of North American *Dioscorea* Bartlett (Bull. Bur. Pl. Indus. No. 189. 6–10, 15 (1910)) has displaced this name by *D. paniculata* Michx. on grounds which do not seem to me sufficient for the overthrow of the Linnaean name. Although the Linnaean species is certainly a complex, as Bartlett has clearly pointed out, it is by no means more likely to be a "source of permanent error and confusion" than are scores of Linnaean names today kept up by practically all authors. The only element in the published description determinable in the light of present-day knowledge is Clayton's number 94, which is *D. paniculata*

[1] *Dioscorea villosa.*

"7. DIOSCOREA foliis cordatis alternis oppositisque, caule laevi.

"Dioscorea foliis cordatis acuminatis: nervis lateralibus ad medium folii terminatis. *Gron. virg.* 121.

"Bryoniae similis floridana, muscosis floribus quernis, folliis subtus lanugine villosis: medio nervo in spinulam abeunte. *Pluk. alm.* 46. *t.* 375. *f.* 5.

"*Habitat in* Virginia, Florida."

of Bartlett's revision; the Plukenetian synonym is unidentifiable. It should be borne in mind that Clayton's plants were worked out by Gronovius with the constant assistance of Linnaeus and that citations from the Flora Virginica have therefore, as represented by still extant specimens actually seen by Linnaeus, a greater value today in the interpretation of Linnaean species than the often unintelligible descriptions and figures of earlier writers not now authenticated by specimens. The usual identity of citations of older authors in both the Flora Virginica and the Species Plantarum is also significant in this connection and may be taken as indicating the probability that the synonymy of the earlier work was likewise due to the coöperation of Gronovius and Linnaeus, and was later adopted directly by Linnaeus for the Species Plantarum. In any case, the fact that the Flora Virginica is nearly always the first cited and that its species are still represented by a nearly complete suite of specimens, while those of the older authors have in most cases to be determined on the basis of more or less dubious figures and descriptions, makes it of supreme importance in the determination of Linnaean names based on complexes of the sort exemplified in *Dioscorea villosa.* It seems to the writer that D. VILLOSA L. must be retained, as it was by nearly all the early American authors, and based on Gronovius's *Dioscorea foliis cordatis acuminatis &c.*, which rests on *Clayton* 94, the Plukenetian synonym being excluded, and Michaux's *D. paniculata*, published as a mere renaming of the Linnaean species, referred to its synonymy. The glabrous-leaved variety, *D. paniculata* var. *glabrifolia* Bartlett, l. c. 15 (1910), recorded from Connecticut to Kansas and Texas by Bartlett, and later from southwestern Michigan by E. J. Hill (RHODORA xiii. 35 (1911)), becomes D. VILLOSA L. var. **glabrifolia** (Bartlett).

5. *Lechea major* L. Sp. i. 90 (1753).[1]— *Helianthemum majus* (L.) BSP. Prel. Cat. 6 (1888), in part.— The type of this species, collected by Clayton ("in Collibus arenosis promontorii Point Comfort dicti Comit: Glocestiae"), is the same species as *Cistus canadensis* L. Sp. i. 526 (1753),[2] the *Helianthemum canadense* of Michaux, Fl. i. 308

[1] *Lechea major.*
"2. LECHEA foliis ovati-lanceolatis, floribus lateralibus vagis. *Gen. nov.* 1074. *f.* 4.*
"*Habitat in* Canadae *aridis.*"

[2] *Cistus canadensis.*
"17. CISTUS herbaceus exstipulatus, foliis omnibus alternis lanceolatis, caule adscendente.
"*Habitat in* Canada. *Kalm.* ♃
"Facies *C. Helianthemi, sed Folia alterna.*"

(1803), at least as to name-bringing synonym. By Michaux the name *Lechea major* was applied to a true *Lechea*, now known as *L. villosa* Ell. Sk. i. 184 (1816). Elliott, when renaming the species, remarks: "As the L. major of Linnaeus is now understood to be the Cistus canadensis and not a Lechea, I have avoided the name to prevent confusion." At about the same time attention was also called to the identity of the two names by Smith in Rees's Encyclopedia (xx. no. 2 ("1819")): "Now it happens that the specimen in the Linnaean Herbarium [of *L. major*] is no other than *Cistus canadensis*." The sheet in the Linnaean Herbarium to which Smith refers bears three fruiting branches of *H. canadense*, but no data. The name *Helianthemum canadense* (L.) Michx. is employed by Elliott for the species (Sk. ii. 4 (1824)) and should according to the International Rules continue to be used for the plant, although *Lechea major* has page priority over *Cistus canadensis*.

For the plant to which Mr. Bicknell, when first drawing attention (Bull. Torr. Club xxi. 257–260 (1894)) to the differences between our two previously confused northeastern species, applied the name *Helianthemum majus*, the first available name seems to be Helianthemum propinquum Bicknell in Britton, Man. ed. 2. 1069 (1905)). This was published as a new species intermediate between *H. majus* (of auth.) and *H. canadense*, and is still upheld by Mr. Bicknell (Bull. Torr. Club xl. 615 (1913)) as distinct, but I am unable, after careful comparison of five good sheets of material showing all stages of growth, collected by Mr. Bicknell and now in the Gray Herbarium, to discover any characters which seem to justify the separation of the plant as a species distinct from the *H. majus* of our present-day manuals — a conclusion in which I have the support of Prof. Fernald, who has previously worked on the group. Dr. Britton's reference (Ill. Fl. ed. 2. ii. 540 (1913)) of *H. propinquum* to *H. georgianum* Chapm. is not supported by the Gray Herbarium specimens referred to the latter species.

6. *Oenothera fruticosa* L. Sp. i. 346 (1753).[1] Tournefort's *Onagra*

[1] *Oenothera fruticosa.*

"3. OENOTHERA foliis lanceolatis, capsulis acutangulis.

"Oenothera florum calyce monophyllo, hinc tantum aperto. *Gron. virg.* 42.

"Onagra angustifolia, caule rubro, flore minore. *Tournef. inst.* 302.

"*Habitat in* Virginia. ♃

"Calyx *purpurascens, tetraphyllus, sed rumpitur altero saepius & unico latere.* Tubus *filiformis, angustissimus.* Capsula *angulis 4 acutis compressis.* Folia *rarius denticulata.*"

angustifolia &c., referred to this species by Linnaeus, is not identifiable, and the name must rest on Clayton's specimens, on which the Gronovian reference was based, and on the specimens in the Linnaean Herbarium. Clayton's plants (nos. 36 & 333), now in the British Museum, are not the species now called *O. fruticosa,* but are *O. linearis* Mx. Fl. i. 225 (1803). In the Linnaean Herbarium the species is represented by a single sheet bearing a large specimen and a fragment of *O. linearis*, in addition to a fragment of the upper portion of a stem of the plant now treated as *O. fruticosa* var. *hirsuta* Nutt. Under these circumstances it becomes necessary to adopt the name O. FRUTICOSA L. for the plant we have been calling *Oenothera linearis,* which necessitates the following transfer: O. FRUTICOSA L. var. **Eamesii** (Robinson) Blake (*O. linearis* Michx. var. *Eamesii* Robinson, RHODORA x. 34 (1908)).

The earliest name clearly referring to a form of the *O. fruticosa* of our manuals, among the many that have been referred by one author or another to this species, seems to be O. HYBRIDA Michx. Fl. i. 225 (1803), the type of which in the Michauxian Herbarium at Paris was identified by Prof. Fernald in 1903 as *O. fruticosa* L. var. *hirsuta* Nutt. (in Torr. & Gray, Fl. i. 496 (1840)). The name O. HYBRIDA Michx. must now be taken up for that plant. Of the earlier names which have been synonymized with *O. fruticosa* (in the older sense), *O. mollissima* Walt. Fl. Carol. 129 (1788) seems to have been *O. laciniata* Hill (1768), as the only specimens in the Walter Herbarium agreeing at all well with his description are of this species; *O. florida* Salisb. Prod. 278 (1796) is a mere renaming of *O. fruticosa* L.; *O. tetragona* Roth, Cat. Bot. ii. 39 (1799), is scarcely identifiable from description, as it may have been either *O. hybrida* (*O. fruticosa* var. *hirsuta* Nutt.) or one of the pubescent species such as *O. pratensis* (Small) Robinson; and *O. chrysantha* Michx. l. c., referred to this species by Léveillé in his monograph of the genus, is correctly identified in the Index Kewensis with *O. pumila* L., as is shown by Prof. Fernald's later determination of the type.

For the less pubescent or subglabrous form, which has been treated as true *O. fruticosa* by most writers, the earliest varietal name seems to be *O. fruticosa β. ambigua* Nutt. Gen. i. 247 (1818), described as "more or less pilose;. . . .leaves lanceolate, or ovate-lanceolate, acute, subdenticulate, petals obcordate, longer than broad;. . . .capsule subsessile, always smooth, oblong, and 4-winged," and said to be

common around Philadelphia, where "in dry and exposed situations ....it....becomes very hairy, in wet places often perfectly smooth." Although, as with the early writers generally, there may have been confusion in Nuttall's mind with others of the closely related species of this group, his description applies with sufficient distinctness to the *O. fruticosa* (typical) of our manuals to justify the adoption of his name for that form in its present varietal rank, as O. hybrida Michx. var. **ambigua** (Nutt.). I refrain from citing other probable synonyms of this form because of the uncertainty which, in the absence of authentic specimens, must attend the identification of the older descriptions of members of the *Kneiffia* group.

7. *Thapsia trifoliata* L. Sp. i. 262 (1753).[1] The Gronovian reference is based on *Clayton* 291, which is a young specimen of the plant called in the 7th edition of Gray's Manual *Thaspium aureum* Nutt. var. *atropurpureum* (Desr.) Coult. & Rose. The synonymy of the yellow form of this species and of *Zizia aurea* (L.) Koch has become badly confused. Thus *Thaspium aureum* Nutt., used by Coulter & Rose (Bot. Gaz. xii. 135 (1887)) and by the 7th edition of Gray's Manual, is based by Nuttall (Gen. i. 196 (1818)) on the name-bringing synonym *Smyrnium aureum* Pursh, Fl. i. 196 (1814), which in turn rests on the same name of Willdenow (Sp. i. 1468 (1798)), and this on that of Linnaeus (Sp. ed. 1. i. 262 (1753), ed. 2. i. 377 (1762)). The same *Smyrnium aureum* of Linnaeus is also the basis of *Zizia aurea* Koch, Nov. Act. Caes. Leop. xii. 129 (1825). Obviously the name *Smyrnium aureum* can not continue to do service as the basis of specific names in two different genera. Linnaeus's *S. aureum* is now recognized as applying to the *Zizia* (*Z. aurea* (L.) Koch), and the name to be used for the purple-flowered *Thaspium* is accordingly Thaspium trifoliatum (L.) Gray (as to syn.), Man. ed. 2. 156 (1856), with which *Smyrnium atro-purpureum* Desr. in Lam. Ency. iii. 667 (1789), with its various subsequent combinations, is synonymous. For the yellow-flowered form it becomes necessary to create a new name, since the various designations hitherto in use have been based on *Thaspium aureum* Nutt., which as has been shown rests on *Smyrnium aureum* L. and is not applicable to the *Thaspium*. It may be called:

[1] *Thapsia trifoliata*.
"4. THAPSIA foliis ternatis ovatis.
"Sium folio infimo cordato, caulinis ternatis; omnibus crenatis. *Gron. virg.* 31.
"*Habitat in* Virginia.
"Semina singula gaudent alis 5, longitudinalibus, membranaceis, & involucra nulla sunt uti in praecedente, cum qua genera conjungo, quamvis facie diversa."

THASPIUM TRIFOLIATUM (L.) Gray var. **flavum**: omnino ut apud plantam typicam sed floribus aureis.— As TYPE may be designated a sheet from ILLINOIS: rich woods, Peoria, May & July, 1904, *F. E. McDonald* (in Gray Herb.)

8. *Azalea lutea* L. Sp. i. 150 (1753).[1]— *A. nudiflora* L. Sp. ed. 2. i. 214 (1762).[2]— In recent floras *Azalea lutea* L. has been considered identical with *A. calendulacea* Michx. (= *Rhododendron calendulaceum* (Michx.) Torr.), while *A. nudiflora* L. (= *Rhododendron nudiflorum* (L.) Torr.) is retained for an entirely different species with pink flowers. Comparison of the original descriptions of both species cited in the footnotes is sufficient to show, however, that the later *A. nudiflora* is a mere renaming of *A. lutea*, since the added citations have introduced no new element into the species.

The Clayton plant, type of the *Azalea ramis infra flores nudis* of Gronovius, is *Rhododendron canescens* (Michx.) D. Don; the specimen of *Azalea nudiflora* in the Cliffortian Herbarium is the *R. nudiflorum* of authors; the Colden plant, from which the specific name first used by Linnaeus was derived, was probably *R. calendulaceum* (Michx.) Torr.; and the plant of Plukenet, not now represented by a specimen, is scarcely determinable. The material in the Linnaean Herbarium, consisting of two sheets from Kalm labelled *nudiflora*, represents the *R. nudiflorum* of present treatments. The Linnaean *Azalea lutea* (and *A. nudiflora*, its straight synonym) thus included the three species now generally known as *Rhodendron nudiflorum*, *R. canescens*, and *R. calendulaceum*. All three were described as new by Michaux in 1803 under the names *Azalea periclymenoides*, *A. canescens*, and *A. calendulacea*. Pursh, the next writer on these species, retained all

[1] *Azalea lutea.*
"3. AZALEA foliis ovatis, corollis pilosis, staminibus longissimis.
"Azalea ramis infra flores nudis. *Gron. virg.* 21.
"Azalea scapo nudo, floribus confertis terminalibus, staminibus declinatis. *Hort. cliff.* 69.
"Azalea erecta, foliis ovatis integris alternis, flore luteo piloso praecoci. *Cold. ebor.* 25.
"Cistus virginiana, periclymeni flore ampliori minus odorato. *Pluk. mant.* 49.
"*Habitat in* Virginia. ♄"

[2] *Azalea nudiflora.*
"2. AZALEA foliis ovatis, corollis pilosis, staminibus longissimis. *Kalm. it.* 3. *p.* 110. *Duham. arb.* 1. *p.* 85. *t.* 3.
"Azalea ramis infra flores nudis. *Gron. virg.* 21.
"Azalea scapo nudo, floribus confertis terminalibus, staminibus declinatis. *Hort. cliff.* 69. *Trew. ehret.* 48.
"Azalea erecta, foliis ovatis integris alternis, flore luteo piloso praecoci. *Cold. ebor.* 25.
"Cistus virginiana, periclymeni flore ampliori minus odorato. *Pluk. mant.* 49.
"*Habitat in* Virginiae *siccis.* ♄.
"*Floret ante folia vel sub ipso vernatione & stamina gerit duplo corollis longiora.*"

Michaux's names, referring *A. nudiflora* Willd. Sp. i. 831 (i. e. *A. lutea* L., *A. nudiflora* L.) to *A. periclymenoides*, and his action must be taken as determining the application of the name, particularly since he was followed by Torrey in 1824 when the latter transferred these species to *Rhododendron*. The name *Azalea nudiflora* or *R. nudiflorum* has thus become definitely fixed on the *A. periclymenoides* of Michaux, and its straight synonym *A. lutea* must be attributed to the same species. The specimen in the Hortus Cliffortianus may be considered the type. As it happens, however, the name *lutea* cannot be taken up for our common pink-flowered Azalea, because of the valid *Rhododendron luteum* Sweet, Hort. Brit. ed. 2. 343 (1830), applied to a species of Turkey and validated by his reference to plate 433 (1799) of the Botanical Magazine. The combination *Rhododendron luteum*, based on *Azalea lutea* L., has recently been made by Schneider (Ill. Handb. Laubholzk. ii. 500 (1911); see also p. 1046, where *R. calendulaceum* is adopted in place of his *R. luteum* on account of the prior homonym of Sweet), but unfortunately he follows our recent manuals instead of the earlier and correct disposition of the name in the Synoptical Flora (ii. pt. 1. 41 (1878)), and refers the name to *R. calendulaceum*, retaining *R. nudiflorum* as a distinct species. Those who retain the genus *Azalea* as distinct from *Rhododendron*, however, must either adopt *A. lutea* for the pink-flowered species or take up Michaux's *A. periclymenoides* and discard altogether *A. lutea* and *A. nudiflora*.

(*To be continued.*)

Gray Herbarium.

REPORTS ON THE FLORA OF THE BOSTON DISTRICT,—XXVII.

POTENTILLA.

P. Anserina L. Made land, South Boston (*C. E. Perkins*, June —, 1882). Specimen in herb. N. E. Botanical Club. A waif in this region, being a native of western North America from Mexico northwards, also of Eurasia.

P. argentea L. Dry sunny places, very common throughout.

P. arguta Pursh. Rocky soil in woods and pastures, occasional from Blue Hills northward.

P. canadensis L. Dry soil, common throughout.

P. canadensis L., var. **simplex** (Michx.) T. & G. As common as the typical form and not easily distinguishable from it after flowering.

P. fruticosa L. Swamps (in our territory). Reported as abundant at Ipswich, Essex, Rockport, Lynnfield and Groton; scattered bushes at twelve other stations from Norfolk north and northeast.

P. intermedia L. Roadside, Cambridge (*M. L. Fernald*, June 15, 1891.)

P. monspeliensis L. Dry sunny places, common throughout.

P. monspeliensis L., var. norvegica (L.) Rydb. Introduced in waste places; Manchester, Beverly, Boston, South Boston, Scituate.

P. pacifica Howell. See Rhodora xi. 1–9, 1909. Salt marshes, common all along the coast.

P. palustris (L.) Scop. Swamps and ditches, occasional from Canton and Needham northward.

P. palustris (L.) Scop., f. **subsericea** (Becker) Wolf. Dedham (*S. Harris*, June 13, 1897). Specimen in herb. N. E. Botanical Club. For discussion of this form see Fernald & Wiegand, Rhodora xii. 111, 140, 1910; S. F. Blake, ibid. xv. 165–166, 1913; Fernald & Long, ibid. xvi. 10, 1914.

P. palustris (L.) Scop., var. **villosa** (Pers.) Lehm. See Rhodora xi. 48, 1909 and xvi. 10, 1914. Dedham (*J. R. Churchill*, July 18, 1891); Millpond on Charles River, South Natick (*K. M. Wiegand & Margaret Heatley*, June 30, 1908). Specimen in herb. Wellesley College.

P. pumila Poir. Dry fields and pastures, very common throughout.

P. pumila Poir., f. **ochroleuca** C. A. Weatherby. See Rhodora xi. 152–3, 1909. Roadside in dry gravelly soil, Cambridge (*M. L. Fernald & C. A. Weatherby,* May 26, 1909).

P. recta L. Dry fields and roadsides, occasional.

P. reptans L. Lawn of Gray Herbarium, Cambridge (*M. L. Fernald* et al. June 27, 1900 to 1910), Now eradicated.

P. tridentata Ait. Rocky and sandy places, Plum Island in Ipswich, Hamilton, Salem, Gloucester, Rockport, Marblehead, Wilmington.

PRUNUS.

P. americana Marsh. Roadside near house, E. Boxford (*J. Robinson,* May 5, 1891); roadside escape in dry soil, Halifax (*C. H. Knowlton & A. S. Pease,* May 30, 1907). Native from Connecticut south and west.

P. avium L. Persistent and spontaneous in many places.

P. Cerasus L. Small, late-bearing trees between Topsfield and Beverly (*C. E. Faxon & J. Robinson,* May 19, Sept. 3, 1891.)

P. cuneata Raf. Dry sand and gravel; not reported from southeast towns, but frequent elsewhere.

P. institutia L. Found " in the woods near Mt. Auburn " by Wm. Oakes, whose specimen is in the Gray Herbarium, and observed as lately as 1913 by Mr. Walter Deane, by the Charles River marsh, on the eastern slope of Cambridge Cemetery; Weld Farm, W. Roxbury (*E. & C. E. Faxon,* Aug. 21, 1882 et seq.); " Holbrook Estate," Percival St., Dorchester (*J. R. Churchill,* May 19, 1897).

Emerson in Trees and Shrubs of Massachusetts, 450, 1846, says: "A bush or small tree, found on the banks of Charles River, in Cambridge, by road-sides at Cohasset, and in other places in the vicinity of Boston . . . . This plant was first pointed out to me by my friend E. Tuckerman, and I have since repeatedly met with it."

P. Mahaleb L. South Salem (*J. H. Sears,* June 15, 1887). Introduced from southern France in old gardens, and spontaneous. Specimen in herb. Peabody Acad. Sci.

P. maritima Wang. Dry sandy soil, common on or near the shore; it follows up the Merrimac River to Tyngsboro, thirty miles from the sea, and from there south to Concord, Billerica and Burlington.

P. nigra Ait. A rare escape from cultivation.

P. pennsylvanica L. f. Copses and dry woods, common throughout.

P. Persica (L.) Stokes. Spontaneous seedlings at South Boston, Dedham, Blue Hills and Hingham; probably elsewhere.

P. serotina Ehrh. Dry open woods and roadsides, very common throughout.

P. virginiana L. Borders of thickets and open woods, common throughout.

PYRUS.

P. americana (Marsh.) DC. Moist woods, Essex County, from Wm. Oakes's time to the present, rare.

P. arbutifolia (L.) L. f. Thicket west side of Stetson Pond, Pembroke (*M. L. Fernald,* October 29, 1916). Specimen in herb. N. E. Botanical Club.

P. arbutifolia (L.) L. f., var. **atropurpurea** (Britton) Robinson. Swamps and low woods, common throughout.

P. Aucuparia (L.) Ehrh. Thickets and old fields, frequent.

P. baccata L. Woods, S. Natick (*J. R. Churchill,* Aug. 29, 1908).

P. communis L. Woods and thickets, occasional.

P. Malus L. Pastures and thickets, frequent throughout.

P. melanocarpa (Michx.) Willd. Wet meadows, also ledgy upland, very common throughout.

P. Aucuparia L. × **melanocarpa** (Michx.) Willd. Ipswich (*W. P. Alcott,* May 26, 1908); Pigeon Cove woods, Rockport (*Miss M. E. Carter,* October, 1905); moist meadow, Andover (*A. S. Pease,* July 10, 1902); escape, Hillside St., Milton (*J. R. Churchill,* Sept. 18, 1887).

ROSA.

R. canina L. Roadside, Prospect Hill, Andover (*A. S. Pease,* June 28, 1904); a single bush on "made land," Westland Ave., Boston (*C. W. Swan,* June 19, 1885); Center St., Jamaica Plain (*E. & C. E. Faxon,* July 1, 1888).

R. carolina L. Swamps and wet places, common.

R. cinnamomea L. Persistent around old places, occasional.

R. gallica L. Escaped and well established at Andover and Canton, probably elsewhere.

R. humilis Marsh. Dry soil, apparently common.

R. nitida Willd. Swamps, frequent.

R. RUBIGINOSA L. Dry fields and roadsides, well distributed but seldom abundant.

R. RUBIGINOSA L., var. MICRANTHA (Sm.) Lindl. Occasional.

R. RUGOSA Thunb. Thoroughly escaped at Newburyport, Rockport, Revere and Cambridge. Earliest report 1905. Native of North China, Korea and Japan.

R. virginiana Mill. Moist soil along the seashore and inland, apparently common. Many specimens identified as this species and as *R. humilis* seem to be indistinguishable from each other, and can not be separated readily.

RUBUS.

R. allegheniensis Porter. Dry thickets, common.

R. Andrewsianus Blanchard. Cohasset and the shore towns south, perhaps inland. A late fruiting blackberry with rigid thorns and impressed veins in leaves.

R. frondosus Bigel. Dry thickets, apparently not common. Originally described by Jacob Bigelow in Florula Bostoniensis, 2d ed., 199–200, 1824.

R. hispidus L. Wet woods and swamps, common throughout.

R. idaeus L. var. **aculeatissimus** [C. A. Mey.] Regel & Tiling. Dry open places, common.

×? **R. neglectus** Peck. Andover (*A. S. Pease*, June 14, 1903); Rockport (*E. B. Bartram*, Sept. 13, 1908); thicket, Lynnfield (*M. L. Fernald*, June 16, 1907); roadside, Concord (*W. Deane*, June 5, 1892).

R. occidentalis L. Thickets and fence-rows, frequent throughout.

R. odoratus L. Rich woods, occasional in Essex and Middlesex Counties; sometimes spontaneous from cultivation, as at Cambridge, Sharon and Scituate.

R. pergratus Blanchard. Occasional from Norwood north.

R. pubescens Raf. (*R. triflorus* Richards. See RHODORA xi. 236–7, 1909). Swamps and wet woods, frequent.

R. pubescens Raf., var. **pilosifolius** A. F. Hill. See RHODORA xvi. 151–2, 1914. Purgatory swamp, Norwood (*C. E. Faxon*, May —, 1878). Specimen in Gray Herb.

R. recurvans Blanchard. Occasional.

R. setosus Bigel. Wet places, occasionally on dry upland, common.

R. TRIPHYLLUS Thunb. Vacant lot, Back Bay, Boston (*W. P.

Rich & C. H. Knowlton, June 26, 1907 et seq.). A native of Japan, escaped from Fenway.

R. procumbens Muhl. (*R. villosus* of Gray's Manual ed. 7 not L.). Dry sand and gravel; very common, especially near the coast.

SANGUISORBA.

S. canadensis L. Common and abundant in meadows and edges of salt-marshes in all the Essex County shore towns from Salisbury to Rockport, and in the second tier of towns in Georgetown, Boxford, Topsfield and Hamilton; also considerable stations in Dracut, Bedford and Littleton.

S. MINOR Scop. One station in a hayfield, Wellesley (*K. M. Wiegand,* June 5, 1908).

SORBARIA.

S. SORBIFOLIA (L.) A. Br. Escaped and difficult to exterminate, Beverly (*Frank Stone,* July 1, 1879); escaped and well established, Milton (*E. F. Williams,* June 30, 1895). Often persistent around old places.

SPIRAEA.

S. latifolia (L.) Borkh. Dry or moist soil in open places; very common throughout.

S. PRUNIFOLIA Sieb. & Zucc. Rocky knoll, spreading near site of old greenhouse, Arlington (*C. A. Weatherby,* Aug. 24, 1908); persistent by roadside near old garden, Sudbury (*A. H. Moore,* May 28, 1905).

S. tomentosa L. Old fields and pastures, common throughout.

S. tomentosa L., f. **albiflora** Macbride. RHODORA xvii. 142–143, 1915. Occasional.

[*Waldsteinia fragarioides* (Michx.) Trattinick. There is a good specimen of this in the herbarium of the Peabody Academy of Science, collected by Miss M. W. Nichols in Horswell's woods, Danvers, May 15, 1891. The suggestion is made on the label that it may have been introduced, which seems possible, as this station is so far out of range.]

C. H. KNOWLTON } *Committee on*
WALTER DEANE } *Local Flora.*

Lycopodium sabinaefolium Willd. var. **sharonense** (Blake) comb. nov.— *L. tristachyum* Pursh var. *sharonense* Blake! Fern Bull. xviii. 9 (1910). *L. complanatum* L. var. *sharonense* (Blake) Farwell, Ann. Rep. Mich. Acad. Sci. xviii. 94 (1916), as to syn.— Speciei formae typicae simile, pedunculis longioribus (6.1–7.6 cm.) exceptis.— The plant which I described some years ago as a variety of *Lycopodium tristachyum* proves, when compared with ample material, to be referable to *L. sabinaefolium* Willd. From all specimens of that species examined, however, it differs in its very long (6.1–7.6 cm.) peduncles. The fairly extensive series of specimens in the Gray Herbarium and the herbarium of the New England Botanical Club shows scarcely any peduncles longer than 4 cm., and the average is only 2–3 cm. Willdenow's types, which I examined in 1914 at the Berlin Herbarium, have peduncles 1.5–2.3 cm. long, and were originally labelled "Lycopodium alpinum. Canada. (Richard.)"

The specimens on which this variety was based, from Sharon, Hillsboro Co., New Hampshire (42° 50′ N. Lat.) are of especial interest as affording the southernmost known locality for any form of the species. Mr. Maxon's record (Am. Fern Journ. v. 3 (1915)) of Haberer's Oneida County (New York) specimens is very nearly on the same parallel but is slightly more northern. There appears to be no other New Hampshire record for any form of the species.

In the last edition of Gray's Manual (ed. 7. 58 (1908)) *Lycopodium sabinaefolium* is reported from Staten Island, on the authority of specimens collected by J. C. Buchheister. Plants from Mr. Buchheister, collected in sandy barrens near Rossville, at a station said later to be destroyed by fire, and labeled *Lycopodium sabinaefolium*, are in the Gray Herbarium. Although they are merely young plants without fruit, it may be stated with certainty that they are not *L. sabinaefolium*, but that they are either *L. tristachyum* or *L. complanatum* var. *flabelliforme*. The record of *L. sabinaefolium* from Staten Island should be expunged.— S. F. Blake, Gray Herbarium.

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THE NORTH AMERICAN LITTORELLA.

M. L. Fernald.

One of the rarest plants of the North American flora is the peculiar little member of the *Plantaginaceae* which is called in our floras *Littorella uniflora* (L.) Asch. The plant is known from only a few sandy or muddy shores from Newfoundland to Minnesota and, ever since its original discovery on this continent in 1868, it seems to have been treated without question as identical with the European species, *L. uniflora.* This treatment, originating when the plant was very little known in America and material inadequate, can no longer be maintained, since we now have sufficient material of the North American plant to show that it is constant in its characters and that in nearly every feature it is distinct from the European *L. uniflora.*

The latter plant, which apparently is less rare in Europe than is its representative in America, has a stoutish rootstock, shown in *Flora Danica* or in the *English Botany* as about 0.5 cm. in diameter; the American plant having the rootstock filiform. The European plant has many of the roots thickened and cord-like, becoming almost fusiform; the American has them all filiform. In the European species the leaves are subterete or semi-cylindric and 0.3–1.5 dm. long, with a conspicuously dilated and sheathing scarious stipular base. The American plant, on the other hand, has the leaves flattish, 1.5–5 cm. long, with the scarious base very narrow. In the European species the peduncles of the staminate flowers are 1–6 cm. long, the calyces 4–7 mm. long, with lanceolate segments; and the filaments are 2–4 cm. long, the anthers 2.5–3 mm. long. In the American plant the peduncles of the staminate flowers are only 0.7–2 cm. long; the

calyx 2.5–4 mm. long, with oblong segments; the filaments 0.7–1.2 cm. long, and the anthers 2–2.4 mm. long. The European plant fruits freely, the fruits protruding from the leaf-axils, many of the European specimens showing perfectly mature fruit in late June, July and August, while some of the staminate flowers are still in anthesis; but little of the American material, collected even as late as August and September, shows any trace of mature fruit. Such mature achenes as have been found in the American material show, however, that, whereas the European *L. uniflora* has the thick-oblong pale-brown achene coarsely rugose, the North American plant has the more slender blackish achene nearly smooth or at most barely rugulose. The North American plant is, therefore, distinct from the European in many of its most important characters and it is here proposed as

Littorella **americana**, n. sp., *L. uniflorae* habitu floribusque simile; rhizomate radicibusque filiformibus; foliis planiusculis falcato-arcuatis vel rectis 1.5–5 cm. longis basi scariosa angusta; pedunculis florum masculorum 0.7–2 cm. longis nudis vel 1-bracteatis, bractea plerumque supra medium; calycibus 2.5–4 mm. longis, segmentis oblongis; filamentis 7–12 mm. longis; antheris 2–2.4 mm. longis; acheniis anguste oblongis 2 mm. longis 0.6 mm. crassis nigrescentibus sublaevibus vel rugulosis.

Similar in habit and flowers to *L. uniflora:* rhizome and roots filiform: leaves flattish, falcate-arcuate or straightish, 1.5–5 cm. long; the scarious base narrow: peduncles of staminate flowers 0.7–2 cm. long, naked or 1-bracteate; the bract usually above the middle: calyx 2.4–4 mm. long; the segments oblong: filaments 7–12 mm. long: anthers 2–4 mm. long: achenes narrowly oblong, 2 mm. long, 0.6 mm. thick, blackish, smoothish or rugulose.— Sandy or muddy shores of lakes, ponds and quiet streams, Newfoundland and Nova Scotia to Minnesota. Newfoundland: muddy banks of Exploits River near the mouth of Badger Brook, August 13, 1894, *Robinson & Schrenk,* no. 1; sandy and gravelly shores of ponds, Whitbourne, August 8, 1911, *Fernald & Wiegand,* no. 6219. Nova Scotia: Grand Lake, July 15, 1879, *Elizabeth G. Knight.* Maine: Chemo Pond, Bradley, September, 1891, *F. P. Briggs.* Vermont: shore of Lake Champlain, Alburgh, September 2, 1879, *C. G. Pringle;* abundant, but local, at Spectacle Pond, Wallingford, July 7 and September 4, 1898, *W. W. Eggleston & E. C. Kent* (type in Gray Herb.); July 11, 1899, *Eggleston;* Notch Pond, Ferdinand, August 2–12, 1899, *Eggleston,* no. 1539. Ontario: Ship Island in Gull Lake, Victoria Co., July 29, 1868, *J. Macoun.* Minnesota: Basswood Lake, July 28, 1886, *L. H. Bailey,* no. 437.

Gray Herbarium.

NOTES ON BETULA.

W. W. Ashe.

The finding in the mountains of North Carolina of *Betula papyrifera cordifolia* (Regel) Fern., not only adds another tree to this intensively investigated region but extends the range of this form southward about 550 miles, Goshen, Litchfield County, Connecticut,[1] and Woods Hole, Massachusetts,[2] being the hitherto most southerly reported eastern stations. A single specimen of this birch was noticed in July 1915, on the eastern flank of Mt. Mitchell, in the Black Mountain range. In March 1916, while I was camping on the summit with my associates in the United States Forest Service, Messrs. Noyes and Damtoft, a large number of these trees were noticed on the western slope of the range. In October 1916, the fruit was scant, but in September 1917, abundant fruiting material was collected from a number of trees. In 1916 fruiting material was referred to Blanchard, who seemed to regard it as typical. These investigations show this species to be generally distributed in these mountains above an altitude of 5500 feet in the spruce and balsam forest. Specimens can be located readily at the following places: east slope of Mt. Mitchell on north side of trail between summit and old sawmill commissary, at an altitude of 6200 feet; in the gap to the north of the second of the Black Brothers peaks, which is about one mile north of Mitchell Peak; on the west side of the crest trail near where the Pensacola trail leaves the Buncombe County trail. Nearly every investigator who has ascended the mountain has passed within a few feet of this last tree.

It is estimated that this species forms about .05 of one per cent of this forest. One specimen measured 16 inches in diameter at breast-height and had an estimated height of 70 feet; but the usual range of diameters is from 10 to 12 inches and corresponding heights of from 40 to 60 feet, exceeding the dimensions recorded for the tree in New England. Prof. Fernald has informed me, however, that he has measured trees of this form in Newfoundland 3 to 4 feet in diameter,

[1] Bissell, in Flow. Pl. of Conn., 148 (1910).
[2] Bartlett, Rhod. 11, 231 (1909).

from which it seems that its best individual development is attained on this island.

There seems to be considerable confusion regarding the status of this form. By the seventh edition of Gray's Manual (335, 1908) and by Sargent (Man. 204, 1905) it is regarded as varietal. Britton (Trees, 251, 1908) gives it specific rank but states that it may be only a form of *B. papyrifera* having heart-shaped leaves and Blanchard also regards it as of specific standing. Prof. G. R. Burns (in lit., 1917) states that it intergrades with the type. The cordate-leaved tree, however, at least in the east, is confined to higher altitudes and has a more northerly range; and it is not known to occur in association with the type in the southern part of New York state, in Pennsylvania or in Ohio. Moreover, this seems to be the only form on the higher summits of New England, where it occurs as a small tree. The fact that the cordate form alone occurs in North Carolina, and that there its leaf-form is strongly marked and without indication of variation — foliage was examined from more than 100 trees — would at least seem to give it excellent varietal if not specific characterization. Specimens from this locality are being deposited in the following herbaria: Gray, Arnold Arboretum, New York Botanical Garden, National, Carnegie and Field.

Betula lenta **uber** n. var. Leaves ovate or short elliptic, 2.5–4 cm. long by 2.3–3.5 cm. wide, rounded or very obtuse at the apex, mostly with a broad, deep basal sinus or sometimes oblique, irregularly serrate with three to six pairs primary veins; petiole 0.5–1 cm. long. Fruit same size and scales same shape as in the type, but nutlets narrowly winged. Bark as in type, and inner bark with characteristic birch oil fragrance and flavor. — Banks of Dickey Creek, Smyth County, Virginia, south of Rye Valley Station. January 14, 1914, W. W. A. Characteristic specimens are being deposited in following herbaria: Gray, Arnold Arboretum, N. Y. Botanical Garden, and National.

U. S. Forest Service, Washington, D. C.

NOTES ON THE CLAYTON HERBARIUM.

S. F. Blake.

(*Continued from p.* 54.)

9. *Convolvulus panduratus* L. Sp. i. 153 (1753).[1] The Clayton specimen (no. 641), on which the Gronovian reference is based, has the leaves pubescent beneath, glabrous calyx, stem, and petioles, and glabrous 1–3-flowered peduncles. The name Ipomoea pandurata (L.) G. F. W. Meyer, Prim. Fl. Esseq. 100 (1818), must be restricted to this form with leaves pubescent beneath. The equally common and widely distributed form with leaves glabrous beneath should bear the name I. pandurata (L.) G. F. W. Mey. var. rubescens Chois. in DC. Prod. ix. 381 (1845).

10. *Gratiola virginiana* L. Sp. i. 17 (1753).[2] In the Linnaean Herbarium are five sheets of this species. One sheet, from Kalm, is the *G. virginiana* of all our manuals. Another, with no data, is the same plant, and a third, likewise without data, is probably identical. A fourth, from India, is a very different and unidentified species, while the fifth is a mixture of *Ammania* and "*Gratiola trifida* Willd." All these specimens, however, are nomenclatorially of no consequence in this connection. The Linnaean species, as a reference to the subjoined description will show, is based primarily on the Gronovian reference, which in turn rests on *Clayton* 379. This plant, in the British Museum, is the short-peduncled *G. sphaerocarpa* Ell. Sk. i. 14 (1816), and the name G. virginiana L. must be taken up for this species.

The long-peduncled plant which has passed for *G. virginiana* or *G. virginica* for a century and a half must now be called Gratiola neglecta Torr. Cat. Pl. N. Y. 10, 89 (1819). The earlier name

[1] *Convolvulus panduratus.*

"4. CONVOLVULUS foliis cordatis integris panduriformibusque, calycibus laevibus.

"Convolvulus foliis inferioribus cordatis, superioribus trilobis, calycibus pedunculis petiolisque glabris, caule rubescente. *Gron. virg.* 141.

"*Habitat in* Virginiae *arenosis.*"

[2] *Gratiola virginiana.*

"3. GRATIOLA foliis lanceolatis obtusis subdentatis. *Gron. virg.* 6.*

"*Habitat in* Virginia."

(In Addenda, Sp. ii. 1200 (1753). "P. 17. Gratiola virginiana (adde) Tsieria Manga Nari. *Rheed. mal.* 9. *p.* 165. *t.* 85."

Gratiola officinalis β. carolinensis Pers. Syn. i. 14 (1805), based on *G. officinalis* Michx. Fl. i. 6 (1803) (not L.), which is *G. neglecta*, is quoted by authors as a binomial and attributed to Persoon, but was first published as such by Pursh (Fl. i. 12 (1814)) in synonymy under *G. officinalis*, and consequently cannot be taken up for the species.

11. *Rhinanthus virginicus* L. Sp. ii. 603 (1753).[1] (*Gerardia virginica* (L.) BSP., as to syn. only.) *Clayton* 488, sole type of this species, now in the British Museum, is not the smooth and glaucous *G. virginica* of our manuals, but the puberulous species which in the Synoptical Flora (ii. pt. 1. 291 (1878)) is called *Gerardia flava* L., and in Britton & Brown's Illustrated Flora (ed. 2. iii. 206 (1913)) *Dasystoma flava* (L.) Wood. The specimen in the Linnaean Herbarium under *Rhinanthus virginicus*, which has been the cause of some confusion, is a South American plant received from Escallon (not before 1776, according to B. D. Jackson), which has been identified by Bentham with some doubt (in DC. Prod. x. 558 (1846)) as *Lamourouxia serratifolia* HBK. As this specimen did not constitute an element of the species as originally published, its exact identity is obviously of no importance in the disposition of the name *Rhinanthus virginicus*.

Attention must be called here to the century-old but erroneous reference, originating doubtless in some confusion of specimens which cannot now be traced, of *Rhinanthus virginicus* to the synonymy of the glaucous plant known to the older authors as *Gerardia quercifolia* Pursh, Fl. ii. 423. t. 19 (1814). The latter name well exemplifies a class of names for which I have recently proposed the designation *nomina legitimata* (Contr. Gray Herb. N. S. no. lii. 51 (1917)), — it having been based on a description belonging to one species and a synonym belonging to another, and afterward restricted by authors to the plant described to the exclusion of the synonym. It seems now impossible to discover the error by which Pursh and Bentham (in DC. Prod. x. 520 (1846)), and subsequently Gray (Syn. Fl. ii. pt. 1. 291 (1878)) and other authors, including Pennell (Bull. Torr. Club xl. 409 (1913)), were led to refer the Clayton specimen, and consequently *Rhinanthus virginicus* L., to the glaucous species, but in any case the fact remains that *Clayton* 488, basis of the Gronovian name, is not that species but is the puberulous plant almost universally called *Gerardia flava* or *Dasystoma flava*.

[1] *Rhinanthus virginicus*.
"5. RHINANTHUS corollis fauce patente, foliis sinuato dentatis. *Gron. virg.* 168.†
"*Habitat in* Virginia."

The Linnaean *Gerardia flava* (Sp. ii. 610 (1753))[1] was a complex of the puberulous species, *G. flava* of authors (as to citations), and the glaucous species, *G. virginica* of authors (as to specimen in Linnaean Herbarium). It has been restricted to the puberulous species by practically all authors except Pennell, who has recently referred it to the glaucous plant figured as *G. quercifolia* by Pursh. Under these circumstances it seems advisable to continue the practice of practically all writers and retain the name in its established application for the puberulous species, designating as type the Clayton specimen (no. 9), cited by Gronovius (p. 74) and now in the British Museum, which I have examined. The two names, *Gerardia flava* and *Rhinanthus virginicus*, of the same date (1753), were first combined by Dr. Pennell (Bull. Torr. Club xl. 409 (1913)), who adopted the name *virginicus* (*Aureolaria virginica* (L.) Pennell). Although this name was unfortunately applied by Dr. Pennell to the glaucous species, the *G. virginica* of the manuals, it must now be used, under another generic name, for the puberulous plant generally called *G. flava.*

The oldest name applying to the glaucous species generally known as *G. virginica,* and the only appropriate one it has ever received, is Gerardia glauca Eddy, Med. Repos. N. Y. hex. 2. v. 126 (1808). As this work is decidedly rare, it may be well to quote Eddy's description, which occurs in his "Plantae Plandomenses, or a Catalogue of the Plants growing spontaneously in the Neighborhood of Plandome, the Country Residence of Samuel L. Mitchill. By Caspar Wistar Eddy, Student of Medicine," which is dated from "New-York, August 28th, 1807." It runs as follows: "Gerardia glauca,* (*species nova mihi.*) *Descr. G. foliis inferne lyrato-runcinatis serratis, medio pinnatiffido-erratis* [*sic*], *et superne lanceolatis serratis; caule glauco, paniculato; soribus pedunculatis.*" (Footnote.) "* I have also found this plant about two miles and a half from New-York, but first observed the difference between it and the *G. flava* of Linnaeus in the summer of 1805."

In his preliminary paper on the genera of the *Agalineae* (*Gerardieae* of authors), Dr. F. W. Pennell (Bull. Torr. Club xl. 119–130 (1913))

[1] *Gerardia flava.*
"3. GERARDIA foliis lanceolatis pinnato-dentatis, caule simplicissimo.
"Anonymos floribus flavis speciosis digitali aequalibus. *Gron. virg.* 74.
"Digitalis lutea elatior, jaceae nigrae foliis. *Banist. virg.* 1926. *Pluk. mant.* 64. *t.* 368.
"*Habitat in* Virginia, Canada.
"Caulis *pedalis s. altior.* Folia *opposita, lanceolata, subpetiolata* (*Lycopi aut jaceae*), *basi incisa pinnatim sinubus patulis.* Spica *terminalis, laxa, ex Floribus oppositis, magnis, flavis.* Antherae *in duas spinas deorsum tendentes.* Stamen *quintum deest.*"

has proposed to restrict the name *Gerardia* L. to the tropical American genus of *Acanthaceae* usually known as *Stenandrium* Nees. Dr. Pennell's argument may be briefly summarized as follows, reference being made to the original paper by those requiring further information. The name *Gerardia* was adopted by Linnaeus from Plumier, who had used it for an Acanthaceous plant from the West Indies which by various authors has been identified with apparently good reason as *Stenandrium rupestre* (Sw.) Nees.[1] With this plant (*G. tuberosa* L.), not autoptically known to him, Linnaeus associated four other species — *G. purpurea, G. flava, G. pedicularia,* and *G. glutinosa* — all four known to Linnaeus by personal examination, as is evidenced by his comparatively ample descriptions. The Linnaean diagnosis in the fifth edition of the Genera Plantarum refers entirely to *G. tuberosa.* This species was furthermore cited by J. E. Smith in 1810 (Rees's Ency. xvi. no. 1) as the species to which the name must be restricted in case the Linnaean genus should be divided: "Whatever might be the result of such examination [of the fruit], this plant [*G. tuberosa* L.] must be the true, though it were the only *Gerardia,* and the rest in that case must have a new generic appellation and character."

With this treatment by Dr. Pennell, which has been followed by Dr. Britton in the second edition of the Illustrated Flora, the writer finds himself in complete agreement, although he can not subscribe to the recognition as independent genera of the long recognized sections of *Gerardia* which are generally known as *Dasystoma, Otophylla,* and *Eugerardia.* The name *Dasistoma* Raf. (1819), which in the form *Dasystoma* has generally been applied to the *G. virginica* series, is based, according to Pennell, on *Seymeria macrophylla* Nutt. I have not present means of access to the rare work in which Rafinesque's genus is described, but the synopsis of his characters given by Pennell fully substantiates the latter's reference of the generic name to *Seymeria macrophylla* (which by Pennell is retained as generically distinct from *Seymeria* (*Afzelia*)). The yellow-flowered species of the *G. virginica* group were named *Aureolaria* by Rafinesque in 1837, *Panc-*

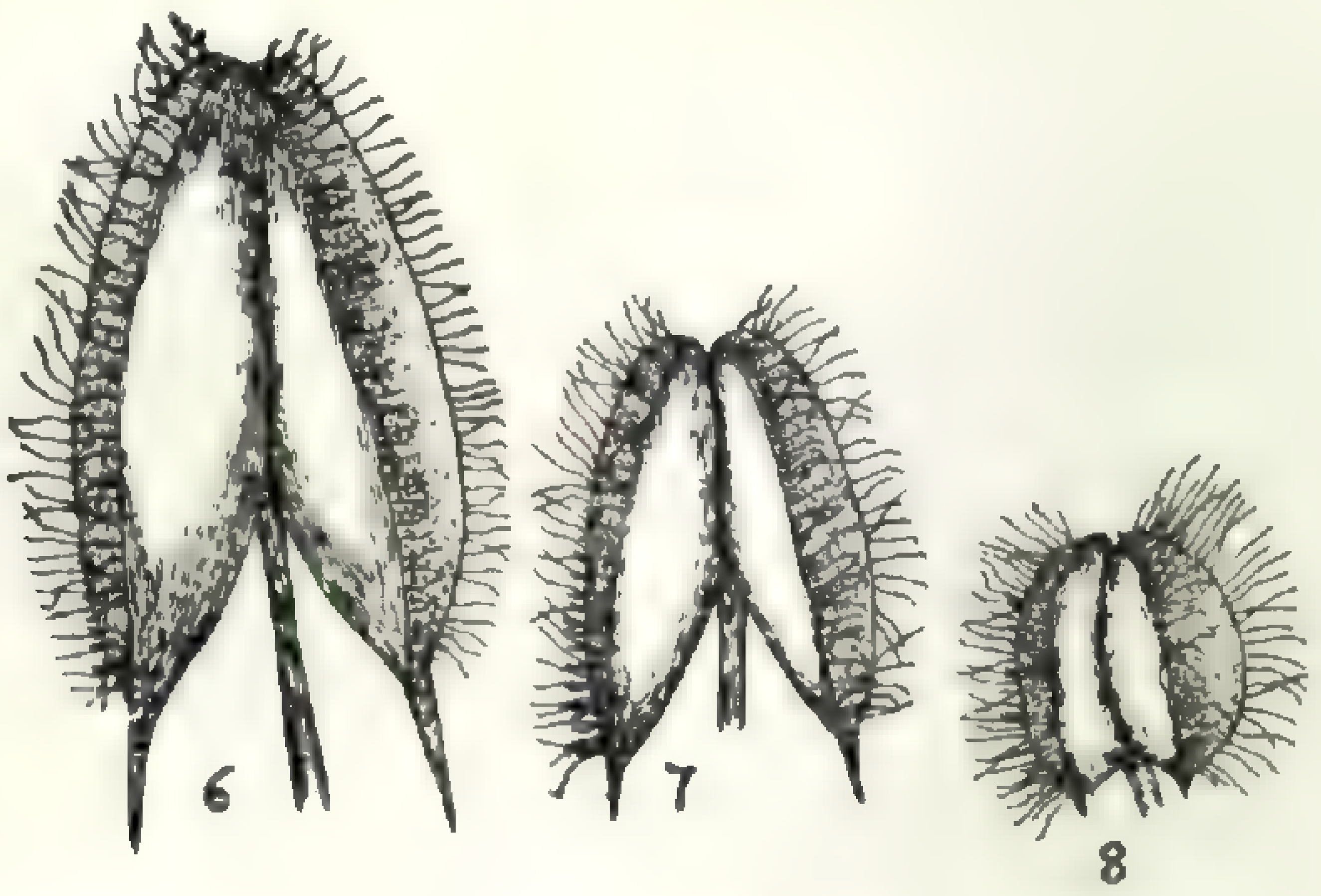
[1] In my recent transfer (Contr. Gray Herb. N. S. no. 52. 100–101 (1917)) of the Mexican and West Indian species of *Stenandrium* to *Gerardia*, two species of the West Indies were accidentally omitted. These are: Gerardia **droseroides** (Nees) comb. nov. (*Stenandrium droseroides* Nees in DC. Prod. xi. 284 (1847)); and Gerardia scabrosa (Sw.) Raf. Fl. Tell. iv. 67 ("1836" = 1837) (*Ruellia ? scabrosa* Sw. Fl. Ind. Occ. ii. 1074 (1800); *Stenandrium scabrosum* (Sw.) Nees in DC. Prod. xi. 284 (1847); Lindau in Urb. Symb. Ant. ii. 208 (1900); *Stenandrium punctatum* Griseb. Cat. Pl. Cub. 196 (1866)).

tenis was proposed for *G. pedicularia* and two very doubtfully distinct species, and *Agalinis* ("remarkable flax") for the purple-flowered species of the *G. purpurea* alliance. The distinctive characters of *Aureolaria* and *Agalinis*, the two genera retained by Pennell for the Coastal Plain members of the genus "*Gerardia*," are thus stated by him (l. c. 404–5).

"Corolla yellow. Anther-sacs parallel, awned at base. Capsule acute to acuminate. Seeds wingless or winged...3. *Aureolaria*.

"Corolla pink or purple. Anther-sacs more or less divergent, obtuse to mucronate-awned at base. Capsule rounded at apex. Seeds wingless.................................4. *Agalinis*."

These characters, it must be confessed, are much more impressive as thus stated than as shown by the specimens themselves. While



Figs. 6–8.— Fig. 6. "*Gerardia*" *pedicularia* L. ("*Aureolaria*".— Rumford, Maine, 1889. *Parlin*). Fig. 7. "*G.*" *peduncularis* Benth. ("*Agalinis*".— Chiapas, *Ghiesbreght* 685). Fig. 8, "*G.*" *tenuifolia* Vahl ("*Agalinis*". — Orange, Connecticut, 12 Sept., 1900, *Bissell*).— All × 5.

the species of the *G. virginica* group have obviously awned anthers, with awns $\frac{1}{4}$–$\frac{1}{2}$ the length of the sacs, there is a very obvious mucro at the base of the cells in many of the purple-flowered species (*Agalinis*), and in *G. peduncularis* Benth., a purple-flowered Mexican species with the habit of *G. purpurea*, which has been referred by Dr. Pennell in mss. notes in the Gray Herbarium to *Agalinis*, the short awns or long mucros, as they may indifferently be called, are precisely intermediate between typical ones of the two groups, and almost identical in relative length with those of *G. grandiflora*, a close ally of *G. virginica*. The unsatisfactory character of the anther-appendages as a means of distinction between the two groups is indicated by figures 6–8, which, while perhaps not strictly accurate in respect to the degree of divergence of the anther-cells, since they are drawn from dried specimens

which have been boiled out, are at any rate so in respect to the awns. Fig. 6 represents a species referred to *Aureolaria*, figs. 7–8 two species referred to *Agalinis* by Dr. Pennell. It does not seem to the writer that the differences in color of flowers and shape of capsule are properly to be taken as of generic value, although they do furnish good group characters. The best course seem to be the retention of the genus as circumscribed by the matured judgments of Gray and of Bentham, adopting for it the name *Agalinis*, to which (in its restricted sense) belong the majority of the species. The following new combinations are required for the species in the Gray's Manual range.

Agalinis Raf. New Fl. ii. 61 ("1836" = 1837).— *Aureolaria* Raf. l. c. 58. *Panctenis* Raf. l. c. 60. *Gerardia* auth., not L. restr.

Subg. **Panctenis** (Raf.).— *Gerardia* sect. *Pedicularioides* Benth. Comp. Bot. Mag. i. 204, 205 (1836).[1] *Aureolaria* and *Panctenis* Raf. ll. cc. (1837). *Gerardia* § *Dasystoma* Gray, Man. ed. 1. 306 (1848), not *Dasistoma* Raf., the name-bringing syn. *Aureolaria* subg. *Panctenis* (Raf.) Pennell, Bull. Torr. Club xl. 408 (1913).

Subg. **Otophylla** (Benth.)— *Gerardia* sect. *Otophylla* Benth. ll. cc. (1836).

Subg. **Euagalinis,** nom. nov.— *Gerardia* sect. *Eugerardia* Benth. l. c. 204, 206 (1836).— Type species *A. purpurea* (L.) Pennell.— The elevation of these groups to subgenera, which seems desirable in view of their characters, makes it possible to avoid the use of Bentham's name, which has now become unappropriate.

Agalinis **pedicularia** (L.) comb. nov.— *Gerardia pedicularia* L. Sp. ii. 611 (1753).

Agalinis pedicularia (L.) Blake var. **ambigens** (Fernald) comb. nov.— *Gerardia pedicularia* var. *ambigens* Fernald, Rhodora x. 86 (1908).

Agalinis pedicularia (L.) Blake var. **pectinata** (Nutt.) comb. nov.— *Gerardia pedicularia* var. *pectinata* Nutt. Gen. ii. 48 (1818).

Agalinis pedicularia (L.) Blake var. **caesariensis** (Pennell) comb. nov.— *Aureolaria pedicularia caesariensis* Pennell, Bull. Torr. Club xl. 413 (1913).

Agalinis **grandiflora** (Benth.) comb. nov.— *Gerardia grandiflora* Benth. Comp. Bot. Mag. i. 206 (1836).

Agalinis grandiflora (Benth.) Blake var. **serrata** (Benth.) comb.

[1] According to a letter from Mr. B. D. Jackson, at the Gray Herbarium, pages 193–224 of the first volume of the "Companion to the Botanical Magazine," including the whole of Bentham's "Synopsis of the Gerardieae," were issued in Feb. 1836.

nov.—*Dasystoma Drummondii* var. *serrata* Benth. in DC. Prod. x. 521 (1846). *G. serrata* Torr. ex Benth. l. c. as syn. *G. grandifolia* var. *serrata* (Torr.) Rob. Rhodora x. 35 (1908).

Agalinis **virginica** (L.) comb. nov.—*Rhinanthus virginicus* L. Sp. ii. 603 (1753). *Gerardia flava* L. 610.

Agalinis **glauca** (Eddy) comb. nov.—*Gerardia glauca* Eddy, Med. Repos. N. Y. hex. 2. v. 126 (1808). *Gerardia virginica* BSP. Prel. Cat. 40 (1889), not *Rhinanthus virginicus* L.; Robinson & Fernald in Gray, Man. ed. 7. 730 (1908).

Agalinis **laevigata** (Raf.) comb. nov.—*Gerardia laevigata* Raf. Ann. Nat. 13 (1820).

Agalinis **auriculata** (Michx.) comb. nov.—*Gerardia auriculata* Michx. Fl. ii. 20 (1803).

Agalinis **densiflora** (Benth.) comb. nov.—*Gerardia densiflora* Benth. Comp. Bot. Mag. i. 206 (1836).

Agalinis tenuifolia (Vahl) Raf. var. **macrophylla** (Benth.) comb. nov.—*Gerardia tenuifolia* var. *macrophylla* Benth. Comp. Bot. Mag. i. 209 (1836).

12. *Gnaphalium obtusifolium* L. Sp. ii. 851 (1753).[1] In the Synoptical Flora (i. pt. 2. 234 (1884)) this name was synonymized by Dr. Gray with *G. polycephalum* Michx., but rejected because "a false name taken from the char. and figure of the doubtful plant of Dill. Elth.", and the sixth and seventh editions of Gray's Manual have followed this usage. However, this view is not sanctioned by modern practices of nomenclature. Clayton's no. 203, at the British Museum, basis of the Gronovian reference, is *G. polycephalum*, and the figure and description of Morison refer likewise to this species. The figure of Dillenius, as well as his description, seems to the writer to agree well with the plant later described as *G. Helleri* Britton in breadth of leaf, pubescence, and other features. This Dillenian reference, based on a plant probably altered by cultivation, has been a source of doubt from early

[1] *Gnaphalium obtusifolium.*

"8. GNAPHALIUM foliis lanceolatis, caule tomentoso, ramoso, floribus terminalibus glomeratis conicis.

"Gnaphalium foliis lanceolatis, caule tomentoso, corymbis supra decompositis, floribus sessilibus confertis. *Gron. virg.* 95.

"Elichrysum obtusifolium, capitulis argenteis conglobatis. Dill. *elt.* 130. *t.* 108. *f.* 131.

"Helichrysum Chrysocoma Gnaphalioides virginiana annua, foliis obtusioribus, capitulis argenteis conglobatis. *Moris. hist.* 3. *p.* 88. *s.* 7. *t.* 10. *f.* 19.

"*Habitat in* Virginia, Pensylvania. ⊙

"Caulis *tomentosus*, *pilosus*, *ramosus*, *erectus*. Folia *lanceolata*, *recurvata*, *nudiuscula*. Flores *terminales*, *conglobati*, *inaequales*, *subsessiles*. Calyces *conici*, *albi*, *acuti*. Corollae *flavae*."

times. Michaux's name *G. polycephalum* was based on *G. obtusifolium* after the exclusion of this same reference ("Obs. *G. obtusifolium*, Linn., omisso synonymo Dillenii, qui plantam cultura mutatam tradidit"). This doubtful element of the Linnaean species, however, can not be considered of sufficient importance to outweigh the fact that all the other constituents are identical with *G. polycephalum*, even though the Linnaean name was taken from Dillenius's specific name ("*Elichrysum obtusifolium, capitulis argenteis conglobatis*"). Such a borrowing of names, often practiced by Linnaeus, cannot logically be regarded as determining the types of the Linnaean species in the same way as in the case of "name-bringing synonyms" in modern binomialism.

The plant described by Britton as *Gnaphalium Helleri* (Bull. Torr. Club xx. 280 (1893)) seems better treated as a variety, as it was by Torrey & Gray (*G. polycephalum β.*) and by Fernald (*G. polycephalum* var. *Helleri* (Britton) Fernald, Rhodora x. 94 (1908)). If the wool of a specimen of *G. obtusifolium* be removed, stipitate glands precisely similar in shape and position to those of the variety are found. It seems fairly certain, then, that the latter represents only a form of the type which lacks the tomentum. It should be called Gnaphalium obtusifolium L. var. **Helleri** (Britton).

The changes in nomenclature here proposed may for convenience be summarized in systematic order as follows. The numbers in parentheses are those under which the species will be found in the preceding discussion.

(1) Eleocharis capitata (L.) R. Br.— *E. tenuis* (Willd.) Schultes.

(1) E. caribaea (Rottb.) Blake — *E. capitata* of auth.

(1) E. caribaea (Rottb.) Blake var. dispar (E. J. Hill) Blake — *E. capitata* var. *dispar* (E. J. Hill) Fernald.

(2) Fimbristylis autumnalis (L.) R. & S.— *F. Frankii* Steud.

(2) F. autumnalis (L.) R. & S. forma brachyactis (Fernald) Blake — *F. Frankii* Steud. var. *brachyactis* Fernald.

(2) F. mucronulata (Michx.) Blake — *F. autumnalis* of auth.

(3) Rynchospora capitellata (Michx.) Vahl — *R. glomerata* of auth. For varieties, see discussion.

(3) R. glomerata (L.) Vahl — *R. glomerata* var. *paniculata* (Gray) Chapm.

(4) Dioscorea villosa L.— *D. paniculata* Michx.

(4) D. villosa L. var. glabrifolia (Bartlett) Blake — *D. paniculata* Michx. var. *glabrifolia* Bartlett.

(5) HELIANTHEMUM PROPINQUUM Bicknell — *H. majus* of auth.

(6) OENOTHERA FRUTICOSA L.— *O. linearis* Michx.

(6) O. FRUTICOSA L. var. EAMESII (Rob.) Blake — *O. linearis* Michx. var. *Eamesii* Rob.

(6) O. HYBRIDA Michx.— *O. fruticosa* var. *hirsuta* Nutt.

(6) O. HYBRIDA Michx. var. AMBIGUA (Nutt.) Blake — *O. fruticosa* of auth.

(7) THASPIUM TRIFOLIATUM (L.) Gray — *T. aureum* var. *atropurpureum* (Desr.) Coult. & Rose.

(7) T. TRIFOLIATUM (L.) Gray var. FLAVUM Blake — *T. aureum* of auth.

(10) GRATIOLA NEGLECTA Torr.— *G. virginiana* of auth.

(10) G. VIRGINIANA L.— *G. sphaerocarpa* Ell.

(11) AGALINIS Raf.— *Gerardia* of Gray's Man. ed. 7.

(11) A. subg. EUAGALINIS Blake — *Gerardia* sect. *Eugerardia* Benth.

(11) A. subg. OTOPHYLLA (Benth.) Blake — *Gerardia* sect. *Otophylla* Benth.

(11) A. subg. PANCTENIS (Raf.) Blake — *Gerardia* sect. *Dasystoma* Gray.

(11) A. AURICULATA (Michx.) Blake — *Gerardia auriculata* Michx.

(11) A. DENSIFLORA (Benth.) Blake — *Gerardia densiflora* Benth.

(11) A. GLAUCA (Eddy) Blake — *Gerardia virginica* of auth.

(11) A. GRANDIFLORA (Benth.) Blake — *Gerardia grandiflora* Benth.

(11) A. GRANDIFLORA (Benth.) Blake var. SERRATA (Benth.) Blake — *Gerardia grandiflora* Benth. var. *serrata* (Torr.) Rob.

(11) A. LAEVIGATA (Raf.) Blake — *Gerardia laevigata* Raf.

(11) A. PEDICULARIA (L.) Blake — *Gerardia pedicularia* L.

(11) A. PEDICULARIA (L.) Blake var. AMBIGENS (Fernald) Blake — *Gerardia pedicularia* L. var. *ambigens* Fernald.

(11) A. PEDICULARIA (L.) Blake var. CAESARIENSIS (Pennell) Blake — *Aureolaria pedicularia caesariensis* Pennell.

(11) A. PEDICULARIA (L.) Blake var. PECTINATA (Nutt.) Blake — *Gerardia pedicularia* L. var. *pectinata* Nutt.

(11) A. TENUIFOLIA (Vahl.) Raf. var. MACROPHYLLA (Benth.) Blake — *Gerardia tenuifolia* Vahl var. *macrophylla* Benth.

(11) A. VIRGINICA (L.) Blake — *Gerardia flava* of auth.

(12) GNAPHALIUM OBTUSIFOLIUM L.— *G. polycephalum* Michx.

(12) G. OBTUSIFOLIUM L. var. HELLERI (Britton) Blake — *G. polycephalum* Michx. var. *Helleri* (Britton) Fernald.

GRAY HERBARIUM.

DATES OF EATON'S FERNS OF NORTH AMERICA.

Mary A. Day.

Mr. W. R. Maxon has called my attention to the fact that there is no evidence in the two volumes of D. C. Eaton's Ferns of North America that the work was issued in fascicles or that each complete volume was not published at a single date. In looking through the contemporary periodicals, however, I find notices from time to time of the publication of separate parts, twenty-seven having been issued between the last part of 1877 and August, 1880, when the work was completed. These notices were found in American Journal of Science, Botanical Gazette and Bulletin of the Torrey Botanical Club as follows: —

Vol. 1.	Parts	Reviewed in	Date
Pt. I	pp. 1–20	Am. Jour. Sci. ser. 3, xv. p. 72	Jan. 1878
	pl. 1–3.	Bot. Gaz. iii. p. 15	Feb. 1878
Pt. II	pp. 21–43	Am. Jour. Sci. ser. 3, xv. p. 223	Mar. 1878
	pl. 4–6	Bot. Gaz. iii. p. 40	Apr. 1878
Pt. III	pp. 44–72	Am. Jour. Sci. ser. 3, xv, p. 319	Apr. 1878
	pl. 7–9	Bot. Gaz. iii, p. 40	Apr. 1878
Pt. I–III		Bull. Torr. Bot. Club, vi. p. 208	Feb. 1878
Pt. IV & V	pp. 73–113	Bull. Torr. Bot. Club, vi. p. 222	Apr. 1878
	pl. 10–15	Am. Jour. Sci. ser. 3, xv, p. 483	June 1878
		Bot. Gaz. iii. p. 56	June 1878
Pt. VI & VII	pp. 114–160	Am. Jour. Sci. ser. 3, xvi, p. 240	Sept. 1878
	pl. 16–21		
Pt. VIII & IX	pp. 161–208	Am. Jour. Sci. ser. 3, xvi. p. 487	Dec. 1878
	pl. 22–27		
Pt. X & XI	pp. 209–256	Bot. Gaz. iv. p. 116	Jan. 1879
	pl. 28–33		
Pt. XII & XIII	pp. 257–304	Bull. Torr. Bot. Club, vi. p. 298	Mar. 1879
	pl. 34–39	Bot. Gaz. iv. p. 149	Apr. 1879
		Am. Jour. Sci. ser. 3, xvii. 338	Apr. 1879
Pt. XIV & XV	pp. 305–352	Bot. Gaz. iv. p. 174	June 1879
	pl. 40–45		
Vol. 2.			
Pt. XVI & XVII			
Pt. XVIII & XIX			
Pt. XX & XXI		Letter of D. C. E. to A. Gray "in press"	Sept. 1879
Pt. XXII & XXIII			

Vol. 2.	Parts	Reviewed in	Date
Pt. XXIV–XXVII	pp. 181–272 pl. 70–81	Bot. Gaz. v. p. 59	May 1880
Completion of the work	273–285	Literary World, xi. p. 296,	28 Aug. 1880
		Am. Jour. Sci. ser. 3, xx. p. 157	Aug. 1880

The complete work is not covered by these notices, nor is the exact date of publication of the numbers of the periodicals given. Wishing to get more accurate data I sent to Mr. C. E. Faxon, one of the illustrators, the information I had found and asked if he could add to it. Fortunately he had kept his copy in the original covers and had recorded on each part the date on which it was received by him. A few days before his death he very kindly sent the following compilation to me with the permission to use it in this article.

Fascicles.	Pages and plates.	Received by Mr. Faxon.
Pt. I	pp. 1–20, pl. 1–3	Nov. 28, 1877
" II	" 21–44, " 4–6	Jan. 31, 1878
" III	" 45–68, " 7–9	Feb. 28, 1878
" IV–V	" 69–114, " 10–15	Apr. 30, 1878
" VI–VII	" 115–160, " 16–21	July 24, 1878
" VIII–IX	" 161–208, " 22–27	Oct. 7, 1878
" X–XI	" 209–256, " 28–33	Dec. 18, 1878
" XII–XIII	" 257–304, " 34–39	Feb. 21, 1879
" XIV–XV	" 305–352, " 40–45	May 7, 1879
" XVI–XVII	" i–xiv. Vol. I; 1–32 Vol. II. pls. 46–51	June 17, 1879
" XVIII–XIX	" 33–80, pls. 52–57	Aug. 19, 1879
" XX–XXI	" 81–128, " 58–63	Oct. 14, 1879
" XXII–XXIII	" 129–176, " 64–69	Dec. 23, 1879
" XXIV–XXVII	" 177–272, " 70–81	Apr. 1, 1880
	pp. I–XXXI. 273–285.	"Rec'd several weeks later."

Although these dates of receipt were doubtless in each case from one to several days later than those of actual issue, the source of the information was so trustworthy and the approximation to the times of publication obviously so close, that it seems well worth while to place the data on published record.

Gray Herbarium.

THE VALIDITY OF OXALIS AMERICANA.

M. L. Fernald.

The Wood Sorrel of the northern mossy forests of eastern America has been known in all American writings since the days of Michaux and Pursh as *Oxalis Acetosella* L., thus implying the identity of our plant with the European species. Only at one period in American Systematic Botany has the identity of the American and European plants been questioned, and then only in a half-hearted way. In 1824, DeCandolle[1] published the American plant as *Oxalis americana* Bigelow *in litt.*, separating it from the European plant, *O. Acetosella,* by its oblong unequally emarginate petals, as contrasted with the oval obtuse (not emarginate) petals of the European *O. Acetosella.* Bigelow himself in the same year (1824) treated the American plant as *O. Acetosella* with the comment: "The American plant has the petals oblong and unequally bilobate, a character which might be considered specific, did not the European plant, as I find from specimens, sometimes present the same figure."[2] Zuccarini, however, in his *Monographie der amerikanischen Oxalis-Arten* took up Bigelow's *O. americana,*[3] and again in his *Nachtrag* recognized *O. americana* as a distinct species.[4] All subsequent authors, however, have followed Bigelow's own printed statement and have not attempted to separate the American from the European plant.

Our North American Wood Sorrel belongs distinctly in the Canadian zone, overlapping slightly into the Hudsonian, where it occurs in cool mossy woods, abounding through Canada from the southern side of the Labrador Peninsula to the Great Lake region, and south into northern New England and New York, and very locally at high elevations or in cool mountain woods southward to the high mountains of North Carolina and Tennessee, and flowering in summer, from mid-June to August. *O. Acetosella* of Europe is a plant widely dispersed over the continent, running south quite to the Mediterranean region, and growing in apparently much drier open habitats, judging from

[1] DC. Prodr. i. 700 (1824).
[2] Bigel. Fl. Bost. ed. 2, 258 (1824).
[3] Zucc. Mon. am. Ox. 26 (1825).
[4] Zucc. Nachtr. Mon. am. Ox. 35 (1831).

photographs which show *O. Acetosella* associated in colonies with *Anemone nemorosa* and other plants of open woods; and in Europe the plant flowers in early spring, mostly in April and early May. Thus it would seem that *O. Acetosella* of Europe is one of the early spring flowers of open sunny woods, while its North American representative is a summer-flowering plant of the dense Canadian spruce and fir forests. This discrepancy in the flowering seasons and the ranges of the plants at once suggests that they are probably not conspecific, since most plants of Canadian distribution in America occur, when they are found in Europe, much farther north than with us.

The examination of very many plates, in fact all the plates found of the European species, shows the petals to be represented always as obovate and entire, or merely undulate or very obscurely notched at summit; the American material having, as Bigelow said, oblong petals with a conspicuously oblique notch at the tip. Some herbarium material of the European plant, poorly dried, appears, apparently by shrinkage, to be slightly emarginate, but it is significant that the European plates are so constant in showing scarcely any notching. Other characters appear upon investigation. For instance, the capsule produced from the petaliferous flowers in the European plant is conic-ovoid, this form showing not only in herbarium material but in all the excellent European plates; the capsule from the petaliferous flowers of the American plant, on the contrary, is depressed-globose, barely tapering at summit and in some cases almost oblate. The seed of the European plant is conspicuously ribbed with acutish parallel ridges, but the seed of the American plant has these ridges nearly or quite obsolete, the surfaces being smooth or only obscurely ridged. The sepals of the European plant have very delicate marginal hairs, which are usually appressed to the margin and not readily seen, while the sepals of the American plant are conspicuously hispid- to villous-ciliate with widely spreading reddish hairs. Another character of fair constancy appears in the rootstock. In the American plant the persistent bases of the old petioles are conspicuous on the rootstocks on account of the circular calloused tip (the point of disarticulation of the old petioles); in the European material and in the European plates these calloused tips are rarely seen, this difference arising from the fact that in the American plant the disarticulation of the petiole takes place above the tips of the subtending persistent stipules, in the European well below the tips of the stipules.

These differences between the plants, as well as the pronounced difference in the distribution of the European and the American Wood Sorrels indicate that DeCandolle and Zuccarini were correct in maintaining the American plant as a distinct species, and that Bigelow's first impulse to separate the American plant was well grounded, although he afterward, from failing to observe the numerous concomitant characters, reduced his own species. The Wood Sorrel of northeastern America should, therefore, be known as *Oxalis americana* Bigelow.

The typical *Oxalis americana* has the petals white, delicately lined with pink or crimson, rarely with the pink tinge nearly or quite absent. Occasionally colonies are found with the petals bright rose-purple, quite parallel with the European plants which have been called *O. Acetosella,* var. *subpurpurescens* DC. These plants, however, represent merely a color form, which occurs more or less sporadically through the range of the typical form of the species, and they are best treated as forms rather than as varieties. The form with the rose-purple petals in America may be called

Oxalis americana Bigelow, forma **rhodantha,** n. f., petalis purpureis.

Petals purple.— Maine: swamp, Chesterville, July 3, 1906, *Agnes Chase & Lillian O. Eaton.* New Hampshire: Crawford Notch, *C. E. Faxon* (type in Gray Herb.). Vermont: Garden of Eden, Eden, Lamoille Co., July 19, 1916, *C. H. Knowlton;* mountainside, Manchester, 1892, *A. J. Grout.*

Gray Herbarium.

A VARIETY OF SMILAX GLAUCA.

S. F. Blake.

Some years ago I became acquainted with the fact that *Smilax glauca* Walt., as generally understood, comprises two distinct forms — one a plant with leaves quite smooth or, under a lens, very obscurely papillose beneath, the other with the leaves prominently roughened beneath, either chiefly on the veins or densely over the whole surface, with short subglanduliform bluntish papillae, or even hirtellous-pul-

verulent. The former, if one may judge from the material in the Gray Herbarium, ranges from Massachusetts to North Carolina, and occurs again in Florida and Oklahoma. The latter is represented in the Gray Herbarium and the United States National Herbarium by material from Virginia to northern Florida (Jacksonville), west to Texas (Houston) and north to Ohio and Illinois. The material of this papillose form was separated by the writer in the two herbaria mentioned under a manuscript name, the smooth and more northern-ranging plant being taken as the typical form of the species. Publication of the variety was delayed, however, as the writer expected to have an opportunity to examine the type in Walter's herbarium in the British Museum. However, careful examination of the Walter Herbarium showed no specimen representing Walter's name. In the De Candolle (general) Herbarium at Geneva, however, I found a good specimen of the plant with leaves densely pulverulent beneath, which was labeled "Smilax sarsaparilla L. Carol. merid. Fraser." It seems to the writer that this specimen of Fraser's may be taken, in the lack of any direct evidence from the Walter Herbarium, as indicating the varietal identity of Walter's *Smilax glauca*.[1] It is not suggested that this plant of Fraser's is in any sense a type of Walter's *S. glauca*, but merely that, coming as it does from somewhere near the type locality of Walter's plant, all means for absolutely identifying which are now forever lost, it affords sufficiently strong presumptive evidence of the identity of Walter's *S. glauca* with the papillose form to justify the restricted use of the name in this sense. To this it may be added that the papillose form is much the commoner of the two south of Virginia and that the smooth-leaved form, so far as is shown by the herbaria consulted, is not found in South Carolina.

The two varieties of *Smilax glauca* here recognized may be distinguished as follows.

Smilax glauca Walt. var. **genuina:** foliis subtus dense papillosis vel hirtello-pulverulentis.— *S. glauca* Walt. Fl. Car. 245 (1788), as here restricted.— Virginia: Bedford Co., 1871, *Curtiss* (U. S.[2]). North Carolina: near Waynesville, 900–1500 m., 1910, *Standley* 5513 (U. S.), 5589 (U. S.); Biltmore, 1896–97, *Biltmore Herbarium* 1322, 1322b; Swain Co., 515 m., 1891, *Beardslee & Kofoid*; Sunburst, Haywood Co., 1911, *House* 4610. South Carolina: *Fraser* (hb. DC.)

[1] The description by Walter of his plant as with "foliis . . laevibus" probably refers to their unarmed character rather than to glabrosity.

[2] U. S. = United States National Herbarium; other material cited is in Gray Herbarium.

Georgia: Stone Mt., 1900, *Pollard & Maxon* 482; Tallulah Falls, Rabun Co., 485 m., 1893, *Small*; Dalton, 1900, *Wilson* 87. Florida: Jacksonville, 1893, *Curtiss* 4156 (U. S.); without def. loc., *Chapman*. Alabama: Spring Hill, 1909, *Mackenzie* 4098. Tennessee: Knoxville, 1898, *Ruth* 146 (U. S.), & 1904, *Ruth* 442. Kentucky: Pine Mt., Bell Co., 1893, *Kearney* 485. Ohio: Chillicothe, 1885, *Safford* 411 (U. S.). Illinois: Tunnel Hill, Johnson Co., 1902, *E. L. Ridgway* (U. S.). Louisiana: without def. loc., *Hale, Carpenter*. Texas: Houston, 1872, *E. Hall* 641.

Var. **leurophylla**: foliis subtus glabris laevibus vel interdum obscure punctato-subpapillosis.— Type from Massachusetts: Great Pond, Centreville, 16 June 1896, *E. F. Williams* (in Gray Herb.).— All the material examined from the coast north of Virginia (Mass., R. I., Conn., N. Y., N. J., Del., D. C.) belongs to this variety. Other specimens examined are: Virginia: Fort Myer, 1894, *Mearns;* Peak Mt., Pulaski Co., 670 m., 1892, *Small* (approaching var. *genuina*); Phoebus, 1912, *Robinson* 370; Buckroe, 1912, *Robinson* 369; near Franklin, 1893, *Heller* 1022; Western Branch, 1840, *Rugel*. West Virginia: Durbin, 1904, *Greenman* 134. North Carolina: Tryon, 1899, *Churchill*. Florida; Eustis, 1894, *Nash* 564. Oklahoma: near Page, Laflore Co., 1913, *Stevens* 2700 (approaching var. *genuina*); near Miami, Ottawa Co., 1913, *Stevens* 2278.

Gray Herbarium.

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Rhodora

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SOME SPECIES AND VARIETIES OF ELYMUS IN EASTERN NORTH AMERICA.

K. M. Wiegand.

The genus *Elymus* has long been a problem to students of grasses. The older treatments were wholly inadequate, since several of the common species were formerly unrecognized. During recent years Scribner and others have described several additional species from eastern North America, but no comprehensive treatment of the genus was given by these writers. In 1908 Hitchcock contributed the article on *Elymus* to the seventh edition of Gray's Manual, but this treatment seems not to have cleared the situation to any appreciable extent; and the same statement may be made in reference to the treatment of the genus by Nash in the second edition of Britton and Brown's Illustrated Flora in 1913. During the course of studies upon the plants of central New York, the writer became interested in *Elymus*. The present article is the result of this study. It was begun in the herbarium of the College of Agriculture at Cornell University; but later, through the courtesy of those in charge of the Gray Herbarium, the work was continued and completed at that institution. The revision is herewith presented with the hope that it may contribute toward a clearer understanding of the genus.

In many instances it will be noted that the characters used in the key are not those ordinarily employed to separate species of *Elymus*. To the writer these here used seem more essential, and seem to separate the species more naturally. During the study a very great many measurements were made of all parts of the plant, and a surprising constancy in size, within certain limits was noted in each species and

variety. It was found impracticable to indicate the length of the body of the glume or lemma because of the gradual transition into the awn. In the text all measurements in length of these two organs include the awn. A much better and more definite indication of the size of the floret is found in the palet, the apex of which is easily recognizable. The degree of pubescence of both the florets and the foliage varies widely in nearly every species, yet in some cases it seems to indicate a more or less definite varietal or even specific difference. The breadth, induration and form of the glumes have long been used in distinguishing the species, and in our study also prove of great value. There is, however, much variation of these organs in *E. virginicus* and *E. robustus*.

Much of the previous difficulty in *Elymus* was due to the failure to recognize the species here described as new. This has for years formed a large portion of the material passing as *E. canadensis*. Further confusion has arisen through the failure to differentiate between *E. canadensis* and *E. robustus* along what now seem to be the proper specific lines. The present paper deals only with *E. virginicus*, *E. canadensis* and their immediate allies. These form a rather natural group, from which *E. arenarius*, *E. glaucus*, and other species may be excluded.

Synopsis and Key to the Species treated.

a. Awns straight (when mature and dry): palet 5.2–8 (rarely 8.5–9.2 in *E. virginicus*) mm. long *b.*
- *b.* Glumes broad (0.9–2 mm. wide), strongly indurated and more or less curved at the base *c.*
  - *c.* Glumes 1–2.7 cm. long: lemmas 1–3 cm. long *d.*
    - *d.* Glumes and lemmas more or less awned *e.*
      - *e.* Lemmas and glumes glabrous or merely scabrous on the margins *f.*
        - *f.* Leaves flat: spikes usually included at the base . . *E. virginicus.*
        - *f.* Leaves involute when dry, narrower: spikes mostly exserted: plant lower . . . . *E. virgin.*, var. *halophilus.*
      - *e.* Lemmas and glumes villous-hirsute . . *E. virgin.*, var. *hirsutiglumis.*
    - *d.* Glumes and lemmas awnless or nearly so *E. virgin.*, var. *submuticus.*
  - *c.* Glumes 2.7–4 cm. long: lemmas (2.8–) 3.5–4.5 cm. long: spikes exserted *g.*
    - *g.* Glumes and lemmas villous-hirsute . . . . *E. australis.*
    - *g.* Glumes and lemmas strigose-scabrous or glabrous. *E. aust.*, var. *glabriflorus.*
- *b.* Glumes narrow, often setiform (0.4–0.8 mm. wide), indurated and terete below, essentially straight *h.*
  - *h.* Palet 7.5–8 mm. long: rachis-joints 3–4.5 (rarely 5–8) mm. long: spikelets 2–4-flowered: leaves and sheaths glabrous. . . . . *E. riparius.*

h. Palet 5.2–6.7 mm. long: rachis-joints 1.5–3 mm. long: spikelets 1(rarely 2)-flowered: foliage villous *i.*
i. Lemmas and glumes villous-hirsute.................*E. striatus.*
i. Lemmas and glumes glabrous or slightly strigose *E. stri.*, var. *arkansanus.*
a. Awns curved outward toward apex (when mature and dry): palet 9–11(–15) mm. long (occasionally 8 mm. in *E. diversiglumis*) *j.*
j. Leaves rather thin, usually somewhat villous above: spike slender and rather loose: glumes 2–25(–35) mm. long *k.*
k. Glumes 2–15 mm. long, setiform: spikelets 2–3-flowered: leaves 6–12 mm. wide: lemmas villous-hirsute.....*E. diversiglumis.*
k. Glumes 15–20 (rarely 8–27) mm. long, rather narrow but not setiform, flat above: spikelets 4–7-flowered: leaves 13–20 mm. wide..........................*E. canadensis.*
j. Leaves firm, 5–15 mm. wide, tending to be involute when dry, usually glabrous: spike somewhat denser: spikelets 2–5(usually 3–4)-flowered: glumes 20–25 (rarely 15–35) mm. long, usually broader and flatter *l.*
l. Lemmas glabrous or sparsely hispidulous...............*E. robustus.*
l. Lemmas villous-hirsute....................*E. robust.*, var. *vestitus.*

E. VIRGINICUS L. Sp. Pl. 84 (1753). *E. carolinianus* Walter, Fl. Carolin. 82 (1788). *E. nitidus* Vasey, probably, Bull. Torr. Bot. Club, xiii. 120 (1886). *E. virginicus*, var. *minor* Vasey, small form, Contr. U. S. Nat. Herb. ii. 550 (1891). *E. virginicus*, forma *jejuna* Ramaley, small form, Bull. Geol. and Nat. Hist. Survey Minn. ix. 114 (1894). *E. jejuna* Rydberg, Bull. Torr. Bot. Club, xxxvi. 539 (1909).—Leaves rather narrow, 1.2 cm. wide or less, thin, glabrous or somewhat villous above, green or slightly glaucous; upper sheaths much inflated: spikes rather narrow, straight, included at base or short-exserted; rachis-joints about 5 mm. long: spikelets 2–4-flowered, appressed or somewhat spreading: glumes broad (1.5–2 mm.) and very short-awned (1.4–2.7 cm. long), strongly indurated and curved at the yellowish and usually unstriated subterete base: lemmas 1.8–3 cm. long, glabrous; awn short and straight: palet 6.5–8 (rarely 8.5–9.2) mm. long: grain 5–6 mm. long.— Alluvial bottomlands and stream-banks: Newfoundland and Quebec to District of Columbia, westward to Montana and Colorado, and southward in the central states to Louisiana and Texas.

Var. **halophilus** (Bicknell), n. comb. *E. halophilus* Bicknell, Bull. Torr. Bot. Club, xxxv, 201 (1908).— Differs from the typical form in the lower stature, narrower and involute leaves which are often more glaucous, narrower upper sheaths, and more uniformly exserted short spikes (glumes 12–17 mm. long; lemmas 1.2–22 mm. long; palet 6–8 mm. long).— Brackish marshes and sand along the coast: Washington County, Maine, to Long Island.

Var. HIRSUTIGLUMIS (Scribner) Hitchcock, RHODORA, x. 65 (1908). *E. hirsutiglumis* Scribn. Bull. Div. Agrost. 11, p. 58 (1898). *E. intermedius* Scribner & J. G. Smith, Bull. Div. Agrost. 4, p. 38 (1891).— Differs from the typical form in the villous-hirsute lemmas and

glumes.— Coast of Maine to Pennsylvania and westward to Nebraska and Missouri.

Var. SUBMUTICUS Hooker, Flor. Bor.-Am. ii. 255 (1840). ? *E. curvatus* Piper, Bull. Torr. Bot. Club, xxx. 233 (1903).— Differs from the typical form in the almost complete absence of awns on both glumes and lemmas.— Dartmouth River, Gaspé County, Quebec, and the coast of Massachusetts, and from Illinois to Saskatchewan, Nebraska, Kansas and Oklahoma, also in Washington (*Piper*).

Specimens of *E. virginicus* from central Maine (Penobscot Valley) have unusually large and coarse spikes and large spikelets with the palet 8.5–9.2 mm. long. *E. halophilus* is here maintained as a variety as it differs from the typical form only in minor and variable characters. Many specimens along the coast are transitional in width of leaf, degree of involution, and length of spike.

E. AUSTRALIS Scribner & Ball, Bull. Div. Agrost. 24, p. 46 (1901).— Leaves 12 mm. wide or less, thin, sparingly villous above, rarely glabrous, green or slightly glaucous; upper sheaths scarcely inflated: spikes more or less exserted, straight, 8–14 cm. long; joints of the rachis 3–6 mm. long: spikelets usually slightly spreading, 2–4-flowered: glumes elongated, of medium breadth (2.7–4 cm. long, 0.9–1.1 mm. wide), thick and indurated toward the curved, usually unstriated, yellowish base, villous-hirsute: lemmas 3.5–4.5 cm. long, villous-hirsute; awn long and straight: palet 7–8 mm. long: grain 5 mm. long.— Swampy woods and stream-banks, rarely in drier situations, along the coast from eastern Massachusetts to Georgia; and also in Missouri and Nebraska. The Missouri labels seem to indicate drier situations.

Var. **glabriflorus** (Vasey), n. comb. *E. canadensis*, var. *glabriflorus* Vasey, Contr. U. S. Nat. Herb. ii. 550 (1894). *E. glabriflorus* Scribner & Ball, Bull. Div. Agrost. 24, p. 49 (1901).— Differs from the typical form in the glabrous or merely strigose-scabrous glumes and lemmas; the former slightly broader (1.1–1.8 mm. wide). Dry banks and woods: Ayer, Massachusetts (*Manning*); and from Maryland to Florida, westward through Tennessee and Illinois to Nebraska and Texas.

E. australis is a near relative of *E. virginicus* from which it differs only in the longer awns, more regularly exserted spikes and more generally villous leaves. The differences are, however, sufficiently constant and obvious to warrant its retention as a valid species.

E. **riparius**, sp. nov., procerus; foliis 7–25 mm. latis tenuibus viridibus vel leviter glaucescentibus glabris, vaginis strictis glabris; spicis multum exsertis parum nutantibus 7–20 cm. longis (aristis exceptis); spiculis 2–4-floris subpatentibus, segmentis racheos 3–4.5 raro 5–8 mm. longis, glumis scabris angustissimis (0.4–0.8 mm. latis, 1.8–3 cm. longis) basi tereti indurata flavescente non striata recta,

lemmatibus (2.2–)3–4.5 cm. longis subtiliter et tenuiter hispidulosis, aristis magnis rectis, palea 7.5–8 mm. longa, caryopsibus 5–6 mm. longis.

Plant tall: leaves 7–25 mm. broad, thin, green or slightly glaucous, glabrous; sheaths close, smooth: spikes much exserted, slightly nodding, 7–20 cm. long, exclusive of the awns: spikelets 2–4-flowered, somewhat spreading; joints of the rachis 3–4.5 rarely 5–8 mm. long: glumes very slender (0.4–0.8 mm. wide, 1.8–3 cm. long), terete, and indurated toward the nonstriate, yellowish, straight base; lemmas (2.2–)3–4.5 cm. long, minutely and sparsely hispidulous; awns long and straight: palet 7.5–8 mm. long: grain 5–6 mm. long.— Along stream-margins and in alluvial bottomlands: central Maine, through New Hampshire and Vermont to western Massachusetts, northern Connecticut, westward to western New York, and southward to the mountains of Virginia, West Virginia and Kentucky. The Rhode Island and the Delaware specimens listed below seem out of the normal range. MAINE: Franklin County: river-bank, Farmington, *C. H. Knowlton.* Kennebec County: alluvial river-thickets, Sidney, August 18, 1916, *Fernald & Long,* no. 12747; dry open clay river-terraces, Sidney, August 18, 1916, *Fernald & Long,* no. 12746. Oxford County: Buckfield, 1895, *J. C. Parlin.* NEW HAMPSHIRE: Carroll County: banks of Saco River, North Conway, August 30, 1855, *Wm. Boott.* Grafton County: railroad yards, Woodsville, August 8, 1908, *E. F. Williams.* Cheshire County: alluvial thickets, Alstead, August 2, 1900, *Fernald,* no. 373. VERMONT: Orleans County; Willoughby Garden, Willoughby, August 1, 1894, *E. F. Williams*; North Slide, Willoughby Mountain, August 15, 1896, *E. & C. E. Faxon.* Caledonia County: St. Johnsbury Center, August 17, 1874, *J. W. Congdon.* Addison County: White River Valley, Hancock, July 18, 1908, *E. F. Williams.* Windham County: shore of West River, Townsend, August 26, 1911, August 7, 1913, *L. A. Wheeler,* no. 15; riverbanks, Brattleboro, August 2, 1898, *B. L. Robinson,* no. 85. MASSACHUSETTS: Essex County: Merrimac River banks near the "Deer leap," Andover, September 19, 1903, *A. S. Pease.* Franklin County: banks of North River, Griswoldville, Coleraine, August 4, 1909, *E. F. Williams;* wet roadside, Conway, August 6, 1909, *E. F. Williams.* Hampshire County: Huntington, August 17, 1912, *B. L. Robinson,* no. 755. Hampden County: Westfield, August 12, 1901, *M. A. Day,* no. 55. Berkshire County: Williamstown, July 28, 1898, *J. R. Churchill;* Stockbridge, August 23, 1902, *R. Hoffmann;* Pittsfield, September 23, 1899, *R. Hoffmann.* RHODE ISLAND: Providence County: border of Pawtuxet River, Cranston, August 4, 1911, *Thos. Hope.* CONNECTICUT: Hartford County: East Granby, August 4, 1901, *A. W. Driggs;* river-banks, Southington, August 17, 1895, *C. H. Bissell,* no. 753. Litchfield County: alluvium of the Housatonic, Canaan, September 6, 1909, *Fernald.* NEW YORK: St. Lawrence County; roadside, Pitcairn, August 1, 1914, *O. P. Phelps,* no. 132.

Orange County: August 11, 1889, *G. V. Nash.* Tompkins County: in dry woods, Six Mile Creek, Ithaca, July 29, 1913, *E. L. Palmer*, no. 167; near Beech Woods, Six Mile Creek, July 29, 1914, *F. P. Metcalf*, no. 1744; damp thickets, Violet Island, Cascadilla Creek, Ithaca, August 18, 1913, *E. L. Palmer*, no. 168; dry woods along lower state road, Cayuga Heights, Ithaca, July 18, 1916, *F. P. Metcalf*, no. 5874; damp alluvial thickets, Fall Creek, Forest Home, Ithaca, August, 1916, *F. P. Metcalf*, nos. 5868, 5869; bottomland woods and thickets in alluvial soil at head of Cayuga Lake, Ithaca, August, 1915, *A. J. Eames*, no. 3566, and *Eames & MacDaniels*, no. 3567 (TYPE in Gray Herb.), August, 1916, *F. P. Metcalf*, nos. 5866, 5867, 5870. DELAWARE: New Castle County: Wilmington, *E. Tatnall.* VIRGINIA: Page County: Stony Man Mountain and vicinity, near Luray, alt. 3800 ft., August 28, 1901, *E. S. & Mrs. Steele*, no. 189. Smyth County: Middle fork of Holston River, Marion, alt. 2100 ft., August 6, 1892, *J. K. Small.* WEST VIRGINIA: Monroe County: Sweet Springs, alt. 550 ft., *E. S. & Mrs. Steele*, no. 218. Pocohontas County: gravelly soil by East fork of the Greenbrier River, near village of Travellers Repose, September 19, 1904, *A. H. Moore*, no. 2345; same, *J. M. Greenman*, no. 89. Tucker County: banks of Blackwater River near Hendricks, September 10, 1904, *J. M. Greenman*, no. 56. KENTUCKY: Harlan County: Big Black Mountain, August, 1893, *T. H. Kearney Jr.*, no. 236.

This plant in aspect resembles *E. canadensis*, *E. striatus* and *E. australis*. In the herbaria it has passed under all three names. Its characters are, however, distinct and constant, and it is really one of the most distinct of the species here treated. It differs from *E. canadensis* and *E. robustus* in the more spreading spikelets, straight awns, longer and more slender glumes, uniformly hispidulous lemmas, and shorter palet. From *E. striatus* it may be recognized by the coarser habit, glabrous foliage, longer rachis-joints, scabrous lemmas, and longer palet. From *E. australis* and its variety *glabriflorus* it is told by the glabrous leaves, slender straight glumes, and usually longer more open spikes. *E. riparius* is very common in central New York.

E. STRIATUS Willd., Sp. Pl. i. 470 (1797). *E. villosus* Muhl. in Willd. Enum. Hort. Berol. 131 (1809). *E. striatus*, var. *villosus* Gray, Manual, ed. 5, 639 (1867). *E. striatus*, var. *Ballii* Pammel, Ia. Geol. Surv. Suppl. Rep. 1903, 347 (1904).— Plant slender: leaves thin, 6–10 mm. wide, green, villous on the upper surface; sheaths close, villous: spikes rather short, 4–9 cm. long exclusive of awns, slightly nodding, long-exserted; rachis-joints very short, 1.5–2.5 (–3) mm. long; spikelets small, 1- rarely 2-flowered, spreading: glumes very narrow, 0.4–0.6 mm. wide, 1.4–3 cm. long, terete and indurated toward the unstriated yellowish base, straight, villous:

lemmas villous, 2.3–5 cm. long; awn long and straight: palet short, 5.2–6.7 mm. long: grain 3 mm. long.— Rocky woodlands and dry thickets: Vermont and eastern Massachusetts to Delaware, and the mountains of North Carolina, westward to Wisconsin, Nebraska, Kansas, and Oklahoma.

Var. ARKANSANA (Scribn. & Ball) Hitchc., RHODORA, viii. 212 (1906). *E. arkansana* Scribner & Ball, Bull. Div. Agrost. 24, p. 45 (1901).— Differs from the typical form in the almost or completely glabrous glumes and lemmas.— Iowa, Missouri, and Arkansas, according to Scribner and Ball. The writer has seen specimens from Nebraska and Virginia (Bedford County, *A. H. Curtis*, July 1871); also doubtful ones from Illinois (Stark County, *V. H. Chase*, no. 45).

E. DIVERSIGLUMIS Scribner & Ball, Bull. Div. Agrost. 24, p. 48 (1901).— Plant of medium height, more or less glaucous: leaves thin, narrower than in the next, 6–12 mm. wide, more or less villous above: spikes much exserted, long, flexuous, nodding and slender (10–20 cm. long); rachis-joints 5–8 mm. long: spikelets mostly appressed, 2- rarely 3-flowered: glumes very short and subulate or acicular, unequal, straight (2–15 mm. long), scabrous or smooth, yellowish and indurated below: lemmas villous-hirsute, 2–4 cm. long; the slender awns much curved when dry; palet 8.5–9 mm. long.— Wisconsin, Minnesota, North Dakota, and Wyoming.

This plant seems to be limited to the northern Great Plains region, and the few specimens at hand would indicate that it is scarce. There is in the Gray Herbarium a specimen which from the label would seem to be a portion of the type material of Buckley's *E. interruptus*. At first glance this is difficult to distinguish from *E. diversiglumis*, but the glumes are somewhat longer and the lemmas are glabrous. It was matched by no other material at hand.

E. CANADENSIS L., Sp. Pl. 83 (1753). *E. philadelphicus* L. Amoen. Acad. iv. 266 (1759). *E. glaucifolius* Muhl. in Willd. Enum. Hort. Berol. 131 (1809). *E. Canadensis*, var. *glaucifolius* Torr. Fl. U. S. i. 137 (1824).— Plant tall and more or less glaucous: leaves thin and broad, the larger 1.3–2 cm. wide, not involuting, villous above, rarely nearly glabrous: spikes exserted, rather loose and long (10–30 cm. in length), flexuous and nodding; rachis-joints 5–8 mm. long: spikelets slightly spreading, 15–25 mm. long, (3–)4–7-flowered: glumes shorter than in the next (2–27, usually 15–20 mm. long), flat but rather narrow, slightly indurated at base, straight, glabrous, scabrous or hispidulous, tapering to the short awn: lemmas villous-hirsute, rarely almost glabrous, 3.5–4.5 cm. long; awns long and curved when mature and dry: palet 9–15 mm. long: grain 7–8 mm. long.— Alluvial or sandy riverbanks: Gaspé County, Quebec, to the interior of Maine, New Hampshire, Vermont, western Massachusetts, northern Connecti-

cut, and northern and central New York. Quebec: Gaspé County: alluvial thickets and woods near mouth of Dartmouth River, August, 1904, *Collins, Fernald, & Pease.* Wright County: Pickanock River, August, 1894, *J. Macoun*, no. 7421. Maine: Aroostook County: Fort Fairfield, 1881, *K. Furbish*; low gravelly thickets along St. John River, St. Francis, August, 1893, *Fernald*, no. 197; and July, 1900, *E. F. Williams.* Piscataquis County: gravelly shore, Dover, September, 1894, *Fernald*; banks of Pleasant River, Milo, August, 1904, *J. C. Parlin*, no. 1793. Somerset County: sandy river-banks and river-intervales, Dead River, August, 1896, *Fernald & Strong*, no. 490. Oxford County: Rumford, 1889, *J. C. Parlin;* thicket on river-bank, Canton, August, 1906, *J. C. Parlin*, no. 2038. Kennebec County: river thickets, Sydney, August 1916, *Fernald & Long*, no. 12748. New Hampshire: Coos County: Jefferson, August, 1874, *Wm. Boott*; damp roadside near Bois Mountain Station, Jefferson, August, 1907, *A. S. Pease*, no. 10010½; alluvial bank of Israel River, Lancaster, August, 1909, *A. S. Pease*, no. 12289; gorge of Diamond River, Dartmouth College Grant, August, 1914, *A. S. Pease*, no. 16282; river-bank, Northumberland, July, 1909, *A. S. Pease*, no. 12127; "Lost Nation," Northumberland, July, 1906, *E. F. Williams.* Vermont: Caledonia County: St. Johnsbury Center, August, 1874, *J. W. Congdon.* Windham County: moist thickets along West River, Townshend, August 11, 1911, *L. A. Wheeler.* Massachusetts: Hampden County: sandy river-bank, sericite schist, Russell, May, 1913, *St. John & White*, no. 30; river-thicket, Westfield, September, 1912, *C. H. Knowlton.* Berkshire County: Williamstown, September, 1897, and July, 1898, *J. R. Churchill*; flood plain, Stockbridge, August, 1902, *R. Hoffmann.* Connecticut: Hartford County: bank of river, East Windsor, August, 1902, *C. H. Bissell.* Litchfield County: dry shaded sandy bank of the Naugatuck River, Reynolds Bridge, September 3, 1910, *A. E. Blewitt.* New Haven County: dry sandy woods, banks of Naugatuck River, Waterbury, "very glaucous all over," July, 1908, *A. E. Blewitt*, no. 35; in sandy thicket, Waterbury, September, 1911, *A. E. Blewitt.* New York: St. Lawrence County: Little River, Canton, August, 1914, *O. P. Phelps*, no. 134. Madison County: Oneida, August, 1906, *H. D. House*, no. 2860.

This species differs from the next in the broad thin villous leaves, longer spikelets with more flowers, shorter glumes and usually in the more slender and open spike. There is some evidence that it matures earlier. *E. canadensis* is a plant of the inland waterways of the Northeast, in situations which are not extremely dry; while *E. robustus* inhabits dry sandy or rocky banks and sand dunes, and has a more southerly and westerly distribution. The striations upon the glumes in both *E. canadensis* and *E. robustus* extend more nearly to the base than in any other species. Specimens of *E. robustus* with

very dense spikes will usually be found to be just in flower. Before maturity the spikes elongate somewhat.

The Linnean type of *E. canadensis* has been discussed by Hitchcock, Contr. U. S. Nat. Herb. xii. 123 (1908). It is there shown that the types of *E. canadensis* and of *E. philadelphicus* were essentially the same, and were a plant with very broad leaves and loose nodding spikes. In his description Linnaeus states that the leaves were very broad, and the spikelets six-flowered. Considering these statements and the fact that the plant came from Canada (*Kalm*) there is little doubt whether this or the next species is the real *E. canadensis*. In the original description of *E. glaucifolius* it also is said to have broad leaves and six-flowered spikelets, and is therefore presumably the same plant, although it came from Pennsylvania from which state we have seen no specimens of *E. canadensis*. However this species is to be expected in the mountains of Pennsylvania. In describing *E. glaucifolius* it was quite possibly contrasted as to glaucescence with *E. riparius* which is scarcely glaucous but which has frequently been mistaken for *E. canadensis*.

E. ROBUSTUS Scribner & J. G. Smith, Bull Div. Agrost. 4, p. 37 (1897). *E. brachystachys* Scribn. & Ball, Bull. Div. Agrost. 24, p. 47, (1901).— Plant low or rather tall, more or less glaucous: leaves firm, with a strong involuting tendency, 5–15 mm. wide, usually entirely glabrous: spikes long-exserted, large (8–20, rarely 25 cm. long), usually rather dense and stiff, upright and but slightly nodding; rachis-joints 4–7 mm. long: spikelets slightly spreading or subappressed, 2–5-, mostly 3–4-flowered, 13–17 mm. long: glumes 15–35, mostly 20–25 mm. long, broad or rather narrow (0.5–2 mm. wide), flat and thin above, flattish or slightly indurated at base, glabrous or nearly so, margins scabrous: lemmas glabrous or sparsely hispidulous, 2.8–5 cm. long; the long slender awn somewhat curved and flexuous when mature and dry: palet 9–11 mm. long, rarely in small plants 8.5 mm. long: grain 6–8 mm. long.— Dry sandy, gravelly or rocky soil: southern Grafton County, New Hampshire, to Windham County, Vermont, eastern Massachusetts and Connecticut; also from Illinois and Michigan to Montana, Colorado, Texas, and New Mexico.

The type material of *E. robustus* (*Pammel*, Iowa), of which a portion from the same distribution is in the Gray Herbarium, has the lemmas entirely glabrous, though the species as originally described included also the var. *vestitus*. The writer has been unable to detect any real difference between *E. brachystachys* Scribn. & Ball and *E. robustus*. Even the alleged difference in length of spike is scarcely apparent.

Var. **vestitus**, var. nov., a forma typica differt lemmatibus villosi-hirsutis.

Differs from the typical form in the villous-hirsute lemmas.— Apparently very common: New Brunswick (introduced) and Maine (introduced) to Delaware, westward to Oregon, southward in the Mississippi Valley to Missouri, and southwest to Arizona. Type (in Herb. N. Y. State Col. Agric., Ithaca): dry ground, Cedar Point, Erie County, Ohio, July 17, 1914, *L. H. MacDaniels*, no. 106.

The *E. canadensis*, forma *crescendus* Ramaley, Bull. Geol. & Nat. Hist. Survey Minn. 9, p. 114 (1894) and the *E. crescendus* Wheeler, Minn. Bot. Stud. iii. 106 (1903) were probably based on material which is here included in the variety *vestitus*, but since they were based on size, not on pubescence of the lemmas, and since the name has not been used as a varietal name, it seems best not to take up one so inappropriate for our present variety. Certain specimens from Minnesota and the Dakotas have hairy leaves and sheaths, and may be the *E. canadensis* var. *villosus* Bates, Amer. Botanist, xx. 17, (1914). In some of the specimens from the Northwest the glumes are unusually narrow.

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ROSA BLANDA AND ITS ALLIES OF NORTHERN MAINE AND ADJACENT CANADA.

M. L. Fernald.

The region of Silurian, Cambrian and Lower Carboniferous limestones and calcareous slates and sandstones extending from northern Maine to the St. Lawrence and across northern New Brunswick to the Gaspé Peninsula and Anticosti is strongly differentiated from the coastwise district of southern Maine, southeastern New Brunswick, and Nova Scotia, where the soils are chiefly derived from acid or at most only slightly calcareous rocks. Hundreds of species are known from the St. John Valley in Maine and New Brunswick and from Rimouski Co., Quebec, to Gaspé and Anticosti which are quite absent from the acid soils to the south and southeast; and almost every group of plants, when critically studied, furnishes striking cases of this differentiation.

In the genus *Rosa* this segregation along lithological lines is as pronounced as in other genera, with the result that in the acid or hardly calcareous coastwise region from southern New England to northeastern New Brunswick, the Magdalen Islands and southern Newfoundland *Rosa virginiana* L. and *R. carolina* L.[1] (*R. humilis* Marsh.) abound in the drier habitats and *R. nitida* Willd. in the bogs; while swamps and pond-shores northward to Megantic Co., Quebec, north-central Maine, and southwestern New Brunswick are often characterized by the abundance of *R. palustris* Marsh. (*R. carolina* Auth., see foot-note 1). In these four species of southern arid habitats the infrastipular prickles are normally present, the pedicels, hypanthiums and hips more or less bristly, and the achenes are borne at the base of the hip.

In the calcareous area to the north and northwest, however, from the St. John valley in Maine to Gaspé and Anticosti, these species are practically unknown (with the exception of rare colonies of *R. nitida* in sphagnous bogs and local colonies of *R. virginiana* in the Devonian sandstones about Gaspé Bay) and their places are taken by three species of quite different character; without infrastipular prickles, with glabrous pedicels, hypanthiums and hips, and with the achenes borne on the inner walls as well as at the base of the hips. These three northern calcicolous shrubs have all passed as *R. blanda* Ait., and since there is some question as to the exact identity of *R. blanda* it is necessary first to consider the original description of that species.

Rosa blanda Ait. Hort. Kew. ii. 202 (1789) was based upon two entirely different plants, which were very soon recognized by other botanists as belonging to quite distinct species. Aiton's treatment was as follows:

[1] *Rosa carolina* L. Sp. Pl. i. 492 (1753) was based solely on *Rosa Carolina fragrans, foliis mediotenus serratis* of Dillenius, Hort. Elth. 325, t. 245, fig. 316 (1732). The figure of Dillenius is beautifully definite and there can be no question that it clearly depicts the common 1-flowered glabrous-leaved *R. humilis* Marsh. with slender straight needle-like infrastipular prickles. Not merely the plate demonstrates this, but the description of the shrub as not exceeding a foot in height and having glabrous leaves is equally definite. The taller swamp species with strongly curved prickles, more corymbed flowers and usually pubescent finer-toothed leaves which has generally passed as *R. carolina* was taken up by Linnaeus as *R. carolina* in the 2d edition of the *Species Plantarum* (1762–63), and the significance of the name thus changed. This accounts for the subsequent very general treatment of the Swamp Rose as *R. carolina*. Dr. Rydberg informs me that the correct name of the Swamp Rose (*R. carolina* of Authors) is *R. palustris* Marsh. Arb. Am. 135 (1785). Marshall's description is characteristically vague but it apparently was intended to cover the *R. carolina* of Authors and the name *R. palustris* is certainly appropriate.

"*blanda.* 3. R. germinibus globosis glabris, caulibus adultis pedunculisque laevibus inermibus.

Hudson's Bay Rose.

Nat. of Newfoundland and Hudson's-bay.

Cult. 1773, by Mr. James Gordon.

Fl. May–August. H. ♄.

Descr. *Caules* adulti laeves, inermes; juniores seu primi anni aculeis rectis subreflexis tenuibus armati. *Rami* teretes, inermes, nitidi, rubicundi. *Folia* pinnata: *foliola* plerumque septem, oblonga, argute et subaequaliter serrata, glabra. *Petioli* glabri, plerumque una alterave spinula armati."

In view of the fact that no wild rose is yet known from Newfoundland with the pubescent foliage, connivent sepals (in fruit) and parietal achenes which are so characteristic of *R. blanda* as commonly interpreted (*R. Solandri* Tratt.[1]), the writer supplied Dr. S. F. Blake when in London with a series of typical specimens of the various plants of eastern America which might have been involved in Aiton's *R. blanda.* From Dr. Blake's examination of the original specimens and their history it appears that Aiton had before him two entirely different roses: (1) a specimen from Hudson Bay, 1773, which, as stated in Dr. Blake's letter, "is true *R. blanda* as now generally understood, with tomentulose petioles, etc., and perfectly smooth calyx-tube"; and (2) a specimen collected by Banks from near St. John's, Newfoundland, a branch with over-ripe fruit bearing glandular bristles at the top but with the sepals fallen, which Dr. Blake writes "is certainly *R. virginiana* Miller (Crépin has written on it 'verus *R. lucida*')." Prior to Aiton's publication these two specimens had been written up, but not published, by Solander as different varieties of a manuscript *Rosa blanda,* the Newfoundland shrub as *R. blanda* α, the Hudson Bay shrub as *R. blanda* β. Examination of Solander's manuscript shows that in this, as in many other cases, the descriptions in *Hortus Kewensis* were derived with only minor changes from the Solander manuscript; but Aiton in the publication, which alone must be considered in settling the nomenclatorial type of *R. blanda,* took the Hudson Bay shrub as the primary portion of the species, making the Newfoundland shrub and the description of it supplementary. Thus the diagnosis "*R. germinibus globosis, caulibus adultis pedunculisque laevibus inermibus*" clearly describes the Hudson

[1] Tratt. Ros. Mon. ii. 150 (1823).

Bay shrub with its glabrous peduncles (or pedicels) and fruit and unarmed stem. In this diagnosis alone did Aiton describe the peduncles and fruit, the supplementary description containing no mention of them. This second description was taken almost without change from the Solander manuscript description of Banks's Newfoundland shrub (*R. virginiana* Mill.), which has glandular-bristly fruit and glabrous foliage, with the petioles frequently spinulose-armed.

It has generally been conceded that the Hudson Bay shrub with glabrous fruit and peduncles is the type of *R. blanda*, but recently some American publications have taken up *R. Solandri* Tratt., based upon the same Hudson Bay specimen as type, and have treated the Newfoundland specimen as the type of *R. blanda*. It should be clear, however, since Aiton's primary diagnosis, in which alone the fruit is described, applies definitely to the Hudson Bay plant, and since he called his species unequivocally the "Hudson's Bay Rose," that he had primarily in mind the Hudson Bay shrub, which he says was cultivated by Mr. James Gordon in 1773. The confusion with the "Hudson's Bay Rose" of material with over-ripe fruit from Newfoundland was natural; but, since the Newfoundland shrub described, without mention of its bristly fruit, in the last paragraph, proves to have been a somewhat uncharacteristic specimen of the earlier-published *R. virginiana*, a common species of southeastern Newfoundland, it would be a suppression of Aiton's obvious intent to urge that, because in the third paragraph "Newfoundland" precedes "Hudson's-bay," Aiton's *R. blanda*, the "Hudson's Bay Rose," with glabrous fruits must be made to rest upon the Newfoundland specimen with bristly fruit as type.

The specific name *blanda*, too, is highly appropriate for a species with smooth fruits, smooth peduncles and unarmed petioles and flowering branches, but it would be peculiarly inappropriate for a shrub with bristly fruits and peduncles, spinulose petioles and rhachises, and young stems, as Aiton described the Newfoundland shrub, "aculeis rectis subreflexis tenuibus armati." Although it is possible to argue: "What's in a name? That which we call *Rosa blanda* by the name *Rosa Solandri* would be more clear," it seems sufficiently obvious that Aiton meant by the "Hudson's Bay Rose" the rose which he diagnosed from Hudson Bay and that the name *Rosa blanda* is correctly retained for that species.

Rosa blanda has the sepals persistent and becoming strongly con-

nivent in fruit, forming a beak-like summit to the hips, a character shared with *R. acicularis* Lindl. and other species which occur west of our area. *R. blanda* is a common rose of the river-thickets from northern Maine to the St. Lawrence and Anticosti, but associated with it on the gravels of the St. John River and its tributaries in Maine and New Brunswick is another shrub which, like *R. blanda*, is without infrastipular prickles on the flowering stems and also has glabrous hypanthium and fruit and parietal achenes but the leaves as glabrous as in *R. virginiana* and the sepals as reflexed in mature fruit as in the latter species. In other words, this shrub, which abounds on the calcareous gravels of the St. John River, shares many traits of *R. blanda* and others of *R. virginiana*, yet is thoroughly distinct from either. That it is not a hybrid occurring along the borders of the ranges of *R. blanda* and *R. virginiana* is apparent from the fact that it occurs entirely outside the range of the latter species. So characteristic is this shrub of the St. John Valley that it may appropriately be called

Rosa **johannensis**, n. sp., caulibus 0.3–1 m. altis, adultis inermibus vel imis setosis rufescentibus, junioribus plus minusve setosis vel rare aculeatis, aculeis rectis basi dilatis; ramulis inermibus glabris lucidis plerumque purpurascentibus; stipulis dilatatis adnatis 1.5–3 cm. longis glabris ciliatis plus minusve glanduloso-dentatis, laminis liberis lanceolato-ovatis; petiolis rhachibusque glabris vel sparsissime pilosis glabratisque inermibus; foliolis 5–9 plerumque 7 ovalibus vel anguste obovatis argute serratis supra sublucidis subtus pallidis glabris vel subtus ad venas sparse pilosis 1.5–5.5 cm. longis; floribus solitariis vel corymbosis; pedicellis 1–3 cm. longis glabris; hypanthio glabro subgloboso supra non attenuato basi rotundato in anthesi 5–9 cm. diametro; fructibus oblato-globosis aurantiaco-rubris 1–1.5 cm. diametro; sepalis plus minusve glandulosis lanceolato-ovatis caudato-appendiculatis sub anthesin divergentibus vel reflexis persistentibus, laminis 0.9–1.4 cm. longis appendiculo 1.2–2 cm. longo; petalis roseo-purpureis 2.5–3.5 cm. longis; stylis distinctis persistentibus non exsertis; achaeniis basilaribus parietalibusque.

Stems 0.3–1 m. high; the adult unarmed or at base setose, reddish; the young more or less setose or rarely prickly, with straight broad-based prickles; branchlets unarmed, glabrous, shining, usually purplish: stipules dilated, adnate, 1.5–3 cm. long, glabrous except at the ciliate margin, more or less glandular-dentate; the free blades lance-ovate: petioles and rhachis glabrous or very sparsely pilose and becoming glabrate, unarmed: leaflets 5–9, usually 7, oval or narrowly obovate, coarsely serrate, somewhat shining above, pale beneath, glabrous or sparsely pilose on the nerves beneath, 1.5–5.5 cm. long:

flowers solitary or corymbed: pedicels 1–3 cm. long, glabrous: hypanthium glabrous, subglobose, not attenuate above, rounded at base, in anthesis 5–9 mm. in diameter: fruit oblate-globose, orange-red, 1–1.5 cm. in diameter: sepals more or less glandular, lance-ovate, caudate-appendiculate, after anthesis divergent or reflexed, persistent; the blades 0.9–1.4 cm. long; the appendage 1.2–4 cm. long; petals rose-purple, 2.5–3.5 cm. long: styles distinct, persistent, not exserted: achenes borne at the base and on the walls of the hypanthium.—Valley of the St. John River and tributaries, New Brunswick and Maine. New Brunswick: river-gravels and shingly border of thicket by the St. John River, Woodstock, July 14, 1916, *Fernald & Long*, no. 13,925. Maine: wet gravelly banks of the St. John between the Great Black and Little Black Rivers, July 27, 1917, *Harold St. John;* St. Francis, 1881, *Kate Furbish;* gravelly shores, Fort Kent, 1881, *Kate Furbish,* September 21, 1899, *Fernald;* Winding Ledges, Fort Kent, July 23, 1900, *E. F. Williams;* gravelly shore of the St. John, Van Buren, September 11, 1899, *Fernald* (type in Gray Herb.); gravel-beach of Aroostook River, Fort Fairfield, August 10, 1909, *Fernald,* no. 1949.

Forma **albina,** n. f., petalis albis.—With the typical form, Woodstock, New Brunswick, July 14, 1916, *Fernald & Long,* no. 13,926 (type in Gray Herb.).

Distinguished from *R. blanda,* with which it hybridizes, by its glabrous darker-green leaves and the widely divergent or reflexed mature sepals; from *R. virginiana* by the lack of infrastipular prickles, the glabrous pedicels and hypanthiums, and parietal as well as basal achenes.

The other rose is a more northern shrub of calcareous ledges and thus far known only from Bic in Rimouski Co., Quebec. It is a great pleasure to associate with this species the name of one of the writer's companions in collecting the type-material and for years his companion on many memorable botanical explorations of northern Maine and eastern Quebec, Emile Francis Williams. This species is, therefore, called

Rosa **Williamsii,** n. sp., caulibus 3–5 dm. altis, adultis inermibus vel sparse setosis purpurascentibus; ramulis inermibus glabris; stipulis dilatatis adnatis 1–2 cm. longis subtus glanduloso-pulverulentis valde glanduloso-ciliatis, laminis liberis semiovatis; petiolis rhachibusque glanduloso-pulverulentis -setulosisque; foliolis 5–7 plerumque 7 cuneato-obovatis apice plerumque rotundatis vel subtruncatis supra mediam argute simpliciter vel dupliciter serratis utrinque breviter pilosis subtus in nervis glandulosis 1–3.5 cm. longis; floribus solitariis vel binis; pedicellis 1–1.5 cm. longis glabris; hypanthio glabro ovoideo in anthesin 3.5–4.5 mm. diametro; fructibus pyri-

formibus basi attenuatis succulentis 1.1–1.3 cm. longis 7–8 mm. crassis; sepalis lanceolato-ovatis dorso laevibus vel pilosis plus minusve glanduloso-ciliatis sub anthesin arcte reflexis persistentibus, laminis 5–7 mm. longis, appendiculo foliaceo glanduloso-ciliato 4–8 mm. longo; petalis roseis 1.7–2 cm. longis; stylis distinctis persistentibus nec exsertis; achaeniis basilaribus parietalibusque.

Stems 3–5 dm. high; the adult unarmed or sparsely setose, purplish: branchlets unarmed, glabrous: stipules dilated, adnate, 1–2 cm. long, glandular-pulverulent beneath, conspicuously glandular-ciliate; the free blades semi-ovate: petiole and rhachis glandular-pulverulent and -setulose: leaflets 5–7, mostly 7, cuneate-obovate, chiefly rounded or subtruncate at summit, coarsely and simply or doubly serrate above the middle, short-pilose on both surfaces, glandular on the nerves beneath, 1–3.5 cm. long: flowers solitary or paired: pedicels 1–1.5 cm. long, glabrous: hypanthium glabrous, ovoid, in anthesis 3.5–4.5 mm. in diameter; in fruit becoming pyriform with attenuate base, succulent, 1.1–1.3 cm. long, 7–8 mm. thick: sepals lance-ovate, smooth or pilose on the back, more or less glandular-ciliate, after anthesis tightly reflexed and persistent; the blades 5–7 mm. long; the foliaceous glandular-ciliate appendage 4–8 mm. long: petals roseate, 1.7–2 cm. long: styles distinct, persistent, not exserted: achenes borne at the base and on the walls of the hypanthium.— Quebec: abundant on dry calcareous ledges, Cap Enragé, Bic, Rimouski Co., July 8, 1905, *Williams, Collins & Fernald* (type in Gray Herb.).

A very distinct shrub, differing from *R. blanda* Ait. and *R. acicularis* Lindl. in the tightly reflexed very short sepals and very small hypanthium and fruit; from *R. virginiana* in the small smooth sepals and smooth fruits, the parietal achenes, pubescent foliage, etc., and from *R. johannensis*, described above, in the much smaller flowers and small pyriform fruit, very glandular stipules, petiole and rhachis and pubescent more cuneate leaflets. At the type locality *R. Williamsii* occurred on dry calcareous ledges with *Woodsia oregana* D. C. Eaton, *Draba stylaris* J. Gay, *Arabis Collinsii* Fernald and other calcicolous xerophytes.

Gray Herbarium.

SOME CONNECTICUT PLANTS.

R. W. Woodward.

Panicum oricola. Old Lyme, frequent on banks of tidal streams and along the shores of Long Island Sound. Orange, abundant on a salt marsh coated with sand. Specimens from these stations have been verified by Mrs. Agnes Chase.

Agrostis alba aristata. Old Lyme, frequent in rocky pastures.

Alopecurus geniculatus aristulatus. Franklin, abundant in a swampy depression in glacial gravel.

Puccinellia paupercula alaskana. This plant, reported from the Blackhall river, Old Lyme by Dr. C. B. Graves, occurs in the same town along the shore of Long Island Sound. At the latter station, on some of the plants, a few of the spikelets have noticeably longer glumes and lemmas, with the second glume 5-nerved and the lemma 7-nerved, which suggests a tendency to approach the var. *longiglumis* of Fernald and Weatherby.

Juncus dichotomus. Old Lyme, shore of Long Island Sound.

Luzula campestris bulbosa. Old Lyme, in hard dry soil. This station is of interest, as being north of the ordinary range of this variety, and also because the plants exhibit little of the caespitose character commonly associated with varieties of *Luzula campestris.* Of the hundred or more plants seen by the writer, the majority had only a single culm. The var. *multiflora,* growing on the edges of the station, was strongly caespitose, and showed no tendency to develop bulblets.

Spergularia canadensis. Old Lyme, fairly common along Blackhall river and on muddy shores near Long Island Sound. It occurs in colonies, and also associated with *S. leiosperma.* Groton is the only station reported in the Connecticut Catalogue.

Parnassia caroliniana. In eastern Connecticut, an essentially non-calcareous region, this species, which is commonly classed among the lime plants, is abundant in many places, as, for instance, at Franklin, where it is a common fall flower on wet meadows.

Lechea Leggettii. Plentiful about Wintergreen Lake, New Haven. The writer collected the plant at this station in 1903, and has seen it there many times since.

Convolvulus spithamaeus. The writer collected this species on a low gravel ridge in Franklin, in June, 1908, and has observed it growing at the same station nearly every year since that date. This appears to be the only station reported from Eastern Connecticut.

Pedicularis lanceolata. Franklin, frequent by streams and on low grounds.

Bidens Eatoni. Old Lyme, in brackish marshes, where it grows among tall grasses and sedges, and is not easy to detect till late in the season. The writer's first collection was made September 29, 1915. Professor M. L. Fernald states that the Lyme plant is "perfectly good *Bidens Eatoni;* exactly like the plant from the Merrimac marshes."

Helenium nudiflorum. A colony of several hundred plants in a remote pasture, at Old Lyme.

Lapsana communis. Well established in Franklin, where the writer has collected it for several years. New Haven is the only station reported in the Connecticut Catalogue.

Sonchus arvensis. Old Lyme, on gravelly shores.

Specimens of the above plants, with three exceptions, have been deposited in the Gray Herbarium, and the remaining plants will be deposited later.

New Haven, Connecticut.

Note on the proper Name for the Sassafras.— The scientific name of the common Sassafras, which has suffered at least two alterations within the past four decades, must once more be changed, although the name to be adopted is fortunately that by which the species has been most universally known. The plant was originally described by Linnaeus as *Laurus Sassafras* (Sp. i. 371 (1753)). Salisbury, in pursuance of that policy of "improving" scientific names to which he seems to have given freer rein than almost any other of the early botanists, based the new name *Laurus variifolia* (Prod. 344 (1796)) on *Laurus Sassafras* L. Sp. ed. 2. 530, without a word of description or annotation. His name is consequently a perfect example of the class of still-born names (*nomina abortiva*), which according to the International Rules of Nomenclature, as finally drawn up in 1910, are incapable of adoption unless employed by the first author who transferred the plant to its accepted position. The name *Sassafras*

variifolium (Salisb.) Ktze. Rev. i. 574 (1891), now used by those who follow the Vienna Rules and reject the tautonym *Sassafras Sassafras* (L.) Karst. Deutsch. Fl. 505 (1880–83), must accordingly be dropped. The valid name to replace it is SASSAFRAS OFFICINALE Nees & Eberm. Handb. Med.-Pharm. Bot. ii. 418 (1831), a name given when the species was transferred from *Laurus* to *Sassafras*. It should be mentioned, in explanation of the use of *S. variifolium* (Salisb.) Ktze. in the seventh edition of Gray's Manual (1908), that at the time the Manual was prepared the status of the class of names known as *nomina abortiva* was still under discussion and no legislation regarding them had been incorporated in the International Code.

The subglabrous and more or less glaucous variety, recently discussed by Prof. Fernald in RHODORA, should be called

SASSAFRAS OFFICINALE Nees & Eberm. var. **albidum** (Nutt.) comb. nov.— *Laurus* (*Euosmus*) *albida* Nutt. Gen. i. 259 (1818). *Sassafras variifolium* (Salisb.) Ktze. var. *albidum* (Nutt.) Fernald, RHODORA xv. 16 (1913), q. v. for full synonymy.

Mention should be made of an earlier and (by International Rules) untenable use of the name *Sassafras officinalis* by Siebold in 1830. It occurs in his synopsis of the economic plants of Japan (Verh. Batav. Genootsch. xii. 23 (1830)), as follows.

"Sassafras, Sieb.

"*S. officinalis,* Sieb. *Siromotsi,* Japon. (v. v. h. b.).

"*Sijnon:* Laurus Sassafras P. S....

"*S. Thunbergii,* Sieb. *Kuromotsi,* Japon. (v. v. h. b.).

"*Sijnon:* Lindera umbellata, Th...."

As Siebold's use of the name *Sassafras,* although apparently the earliest in postlinnaean times, is unaccompanied by diagnosis or reference to an earlier generic name, it is not valid according to the International Rules. His name *S. officinalis,* although based on *Laurus Sassafras* P(ers.) S(yn. i. 450 (1805)), must consequently be disregarded. The plant really intended by Siebold is of course not our Sassafras, which does not grow in Japan, but is, according to the Index Kewensis, *Lindera triloba* Blume, while his *S. Thunbergii* is *Lindera umbellata* Thunb.— S. F. BLAKE, Gray Herbarium.

A NEW BOTANICAL TEXTBOOK FOR HIGH SCHOOLS.— Botany now occupies at least in the secondary schools of New England and New York, a rather precarious place in the course of study. Reaction against the formal morphology and systematic botany of the older texts, and the excessive experimentation required by more recent authors, has in many schools crowded botany as such out of the course, and it occupies with zoölogy and physiology, a scant third of the freshman or sophomore year of "biology." A book like Allen and Gilbert's new text[1] ought to revive interest in the science as a matter of practical everyday education for everyone, especially in rural, village and suburban schools.

Simple and for the most part familiar types are studied for thirteen chapters, outlining the great divisions of plant life. The cucumber with its monoecious flowers comes first, thus giving the idea of sex and fertilization clearly at the start. These chapters are not so elaborate nor so scientific as those which correspond in Atkinson's Botany for High Schools, but they are much better adapted for young students.

Five chapters are given to the morphology and uses of roots, stems, leaves, flowers and fruits. The remaining six chapters deal largely with economic botany, including forestry, plant breeding and plant-diseases. Laboratory and field work is carefully planned for each chapter, but it is printed at the end of the book where it does not interfere with the obvious readability of the text.

Instead of giving a mutilated key to the flora, with a small number of species listed and no ranges given, the authors urge the students to use the accepted manuals for various parts of the country.

Much is said incidentally in regard to plant relations to environment, but the book would be considerably stronger if these facts were summed up in a good chapter on ecology, even at the expense of condensation in the economic chapters.

The authors have with clearness and ease given the latest scientific conclusions about plant life and growth. They have been successful in keeping down the number of technical terms to a minimum. The book is worthy of the attention of the general reader, as well as of the High School student and teacher.— CLARENCE H. KNOWLTON.

[1] TEXTBOOK OF BOTANY. By Charles E. Allen and Edward M. Gilbert. pp. 450 + x, illustrated. Cloth, $1.48. D. C. Heath & Co., Boston.

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NOTES ON THE FLORA OF NEW BRUNSWICK.

S. F. Blake.

The plants recorded in the following list were collected by the writer during some seven weeks of the late summer of 1913 spent collecting for the Gray Herbarium along the coastal sands of New Brunswick and the adjacent small islands. The period from 12 August to 3 September was spent at Bathurst on Bay Chaleur on the northern coast of the province, with side trips extending to Petit Rocher to the west, Miscou Island to the east, and the Drummond Iron Mine near Great Falls some distance in the interior from 4 September to 29 September at Chatham and Newcastle, on the Miramichi River, whence excursions were made to Tracadie on the north, Richibucto on the south, and the islands along the mouth of the Miramichi River. The last day's collecting in New Brunswick was done on 30 September at Moncton, on the Petitcodiac River.

The region about Bathurst consists largely of glacial sands and gravels. A mile or two inland extensive "blueberry barrens" are met with, having such representative species as *Lycopodium tristachyum, Pinus Banksiana, Betula alba* var. *papyrifera, Myrica asplenifolia, Salix humilis, Vaccinium canadense, V. pensilvanicum,* and *V. pensilvanicum* var. *nigrum.* The coastal rocks are largely indurated clays and sandstones. At Petit Rocher there is a deposit of limestone, and in a nearby bog or its vicinity were collected such characteristic calciphiles as *Carex aurea, Spiranthes Romanzoffiana, Salix candida, Betula pumila, Ranunculus Purshii, Parnassia caroliniana, Pyrola asarifolia,* and *Valeriana uliginosa.* Along the sands of the coast, from Miscou Island southward, *Myrica carolinensis, Betula populi-*

folia, Euphorbia polygonifolia, Hudsonia tomentosa, Lechea intermedia, and *Teucrium canadense* var. *littorale,* with various other species, find their northern limit, and in the brackish tidal flats of the Miramichi River *Lophotocarpus spongiosus* and *Samolus floribundus.* The only strictly endemic flowering plants at present known from the province are apparently *Aster laurentianus* Fernald var. *contiguus* Fernald and *A. subulatus* Michx. var. *obtusifolius* Fernald.

Lycopodium tristachyum Pursh. Blueberry barrens, Bathurst (*Blake* 5419); Loggieville (5610); Newcastle (5659); in pine woods, Portage Island (5685); St. Louis de Kent (5725). I also found specimens collected by Cox in "sandy barrens behind Chatham, 1897," in the herbarium of the Miramichi Natural History Society at Chatham.

Lophotocarpus spongiosus (Engelm.) J. G. Sm. Brackish tidal mud, French Fort Cove, Miramichi River, Newcastle (5625); brackish tidal mud, mouth of Barnes Creek, two miles above mouth of Moulies River (5731). Recorded (as *Sagittaria calycina* var. *spongiosa*) in Fowler's list [1] (p. 67) from "near the head of the tide in the Richibucto River, and at Rothesay, *Fowler*, Herb.; Tobique River, *Hay.*" Specimens collected by Fowler at Bass River, 28 July 1870, are in the Gray Herbarium.

Digitaria Ischaemum Schreb. (*D. humifusa* Pers.: see Hubbard, Rhodora xviii. 231 (1916).) Along Intercolonial Railway, Petit Rocher (5489).

Panicum subvillosum Ashe. Bathurst (5383); sandy beach, Miscou Harbor (5570). The only *Panicum* found. Recorded by Hitchcock & Chase (Contr. U. S. Nat. Herb. xv. 228 (1910)) from Kent County, 1875, *Fowler;* also at Shediac Cape, 23 July 1914 *Hubbard* 716.

Setaria viridis (L.) Beauv. var. Weinmanni (R. & S.) Brand. (See Fernald & Wiegand, Rhodora xii. 133–134 (1910).) Along Intercolonial Railway, Petit Rocher (5488).

Scirpus campestris Britton var. Fernaldii (Bicknell) Bartlett. Brackish sands, Miscou Harbor (5584). New to the province, and a considerable range extension.— Our common form, var. *paludosus* (A. Nels.) Fernald, was also collected at Bathurst 5427) and on Bay du Vin Island in Miramichi Bay (5706), and a form approaching

[1] Rev. James Fowler, A Preliminary List of the Plants of New Brunswick (Nat. Hist. Soc. of N. B. Bull. no. IV). St. John, N. B. 1885. Pages [1]–82.

var. *novae-angliae* (Britton) Fernald was collected with the last (5707).

Juncus alpinus var. **insignis** × **brevicaudatus**, hybr. nov. Planta habitu floribus etc. *J. alpino* var. *insigni* similis, staminibus tantum 3 *J. brevicaudati* donata.— Mud hole, Petit Rocher, 21 August 1913, *Balke* 5509.

A plant combining the general characters of *Juncus alpinus* Vill. var. *insignis* Fries with the three stamens of *J. brevicaudatus* (Engelm.) Fernald, and probably to be considered a hybrid between them. Both the presumed parents were collected at Bathurst and doubtless occur throughout the region, where no other species of this immediate group was met with.

JUNCUS EFFUSUS L. var. COMPACTUS Lej. & Court. (See Fernald & Wiegand, RHODORA xii. 84 (1910).) Roadside ditch, Richibucto (5730).

JUNCUS EFFUSUS L. var. PYLAEI (Laharpe) Fernald & Wiegand, l. c. 92. Pasture, Grande Anse (5534).

JUNCUS EFFUSUS L. var. SOLUTUS Fernald & Wiegand, l. c. 90. Roadside ditch, Richibucto (5729).

MYRICA CAROLINENSIS Mill. Grande Plaine, Miscou Island (5593); Portage Island (5669); Fox Island (5688); Richibucto (5711); Kouchibouguac (5726). Recorded (as *M. cerifera*) in Fowler's list (p. 56) from "sand beach on the sea shore, Kent and Northumberland [Counties], *Fowler;* Petitcodiac, *Brittain*." Also seen by Prof. Fernald from Kouchibouguac (herb. N. B. Nat. Hist. Soc.) and by the writer from Restigouche, *Hay* (herb. Miramichi Nat. Hist. Soc.); and in the Gray Herbarium from Miscou Island, 1905, *Ganong;* Fox Island, 1892, *Fowler;* Brulé, 1914, *Hubbard*.

BETULA POPULIFOLIA Marsh. Loggieville (5611); Portage Island (5671). Said to be common by Fowler (p. 56). Specimens are in the Gray Herbarium from Bass River, *Fowler;* St. Andrews, 1900, *Fowler;* Shediac Island, 1914, *Hubbard*.

QUERCUS RUBRA L. (of Gray's Man. ed. 7). A single tree in field, Moulies River (5732). The only oak-tree which I met with. Also seen by Prof. Fernald from Richibucto (herb. N. B. Nat. Hist. Soc.). Recorded by Fowler (p. 57) from Kent, Northumberland, and York Counties.

RUMEX PERSICARIOIDES L. (See St. John, RHODORA xvii. 80 (1915).) Wet sands back from beach, Miscou Harbor (5577). Determined by Dr. H. St. John.

Polygonum Raii Bab. (See Fernald, Rhodora xv. 71–73 (1913).) Sandy shore of Nepisiguit Bay, Bathurst (5397); sandy beach, Miscou Harbor (5563); a single plant, sea beach, Grande Plaine, Miscou Island (5597); sandy beach, Tracadie (5634). Not seen on the islands in Miramichi Bay.

Chenopodium rubrum L. Brackish sands, Portage Island (5684).

Atriplex maritima E. Hallier. (See Blake, Rhodora xvii. 83–86 (1915).) Sand bar and sandy beach, Miscou Harbor (5559, 5565); sea beach, Grande Plaine, Miscou Island (5598); beach, Fox Island (5692).

Suaeda americana (Pers.) Fernald. The common *Suaeda* of the eastern New Brunswick coast. Of eleven collections of the genus, made at Miscou Harbor, Lameque, Neguac Island, Fox Island, Bay du Vin Island, Richibucto, and Moncton, ten belonged to this species. One of the two collections made at Moncton, however, was of the next species.

Suaeda maritima (L.) Dumort. Moncton (5739).

Arenaria peploides L. var. robusta Fernald, Rhodora xi. 114 (1909). Tracadie Beach (5650); Portage Island (5679); Fox Island (5695); Bay du Vin Island (5696, 5697); North Beach, Richibucto (5717). Recorded by Fowler (p. 18), under *A. peploides*, as "rare. On sandy shore, Shediac, *Fowler;* Dalhousie, *Ross;* Restigouche, *Chalmers.*" Also seen by Prof. Fernald from Kouchibouguac (herb. N. B. Nat. Hist. Soc.), and by the writer from Portage Island, *Cox* (herb. Miramichi Nat. Hist. Soc.).

Montia rivularis Gmel. (See Fernald & Wiegand, Rhodora xii. 138. t. 84. f. b (1910).) Along brook, Chatham, 4 September (5601). First record for the American continent; previously recorded by Fernald & Wiegand from Newfoundland.

Ranunculus Purshii Richards. In brook, Petit Rocher (5508). Recorded by Fowler (p. 12) as *R. multifidus* from "ditches at Point de Bute and Belledune"; these specimens have been examined by Prof. Fernald, as have others collected at Bass River, *Fowler.*

[*Draba incana* L. Fowler (p. 15) has the following note regarding this species. "Cambridge, Sept. 14, 1881.— I have just received a specimen of Draba incana L., collected by Mr. Charles Lindon of Buffalo, N. Y., in or near Bathurst, N. B.— Sereno Watson." In their revision of the Drabas of this group, Fernald & Knowlton (Rhodora vii. 64 (1905)) likewise referred these specimens (three stems)

to *D. incana,* recording them as from "near Bathurst." Re-examination by Prof. Fernald, however, has shown them to belong not to *D. incana* but to *D. megasperma* Fernald & Knowlton. This latter species is abundant at Paspébiac Beach, a popular place for holiday excursions across the Bay Chaleur from Bathurst, and Prof. Fernald is inclined to believe that the specimens in question came from that place. In any case, the species should be removed for the present from the list of plants definitely known from New Brunswick.]

Draba incana L. var. confusa (Ehrh.) Pers. Grass plain, Grande Plaine, Miscou Island, 28 August (5590). New to the Gray's Manual range.

Sisymbrium officinale (L.) Scop. Waste ground, Chatham (5737).

Tillaea aquatica L. Brackish tidal mud, French Fort Cove, Miramichi River, Newcastle (5626).

Pyrus arbutifolia (L.) L. f. var. atropurpurea (Britton) Robinson. *Ammophila* plain, Portage Island (5678); marsh, Richibucto (5724). A specimen in herb. Miramichi Nat. Hist. Soc., from Bass River, *Fowler,* recorded as var. *melanocarpa* in Fowler's list (p. 26), also represents this form.

Amelanchier stolonifera Wiegand, Rhodora xiv. 144. t. 95. f. 4 (1912). *Ammophila* plain, Portage Island (5677). Determination verified by Prof. K. M. Wiegand.

Crataegus monogyna Jacq. (See Rhodora, xi. 47 (1909).) In field, Richibucto (5735).

Crataegus rotundifolia Moench. Bank of Moulies River, near junction with Richibucto River (5733).

Potentilla palustris (L.) Scop. forma subsericea (Becker) Wolf. (See Blake, Rhodora xv. 165 (1913); Fernald & Long, l. c. xvi. 9–10 (1914).) Dampish meadow, Tracadie (5646).

Potentilla tridentata Ait. Pasture, Miscou Harbor (5544). Fowler (p. 26) notes it from "Buctouche, Carleton, *Fowler*; Sugar Loaf, Restigouche, *Chalmers;* Nerepis, Upper St. John, Head Waters of Tobique, Douglas Mountain, *Hay*, Herb., Bulletin II. 32." The species is also in the Gray Herbarium from Casey's Cape, Kent Co., 1914, *Hubbard*; St. Andrews, 1900, *Fowler*; dry ledges by St. John R., Connors, 1903, *Pease* 2947.

Euphorbia polygonifolia L. Sandy beach, Tracadie Beach (5651). Recorded by Fowler (p. 55) from "Kouchibouguac beach in sand."

Hudsonia tomentosa Nutt. Neguac Island (5661); Portage Island (5675); Fox Island (5689); Richibucto (5710); Kouchibouguac (5728). Fowler records it (p. 16) as "abundant on Kouchibouguac beach, *Fowler;* Bathurst, *Chalmers.*" A specimen from Portage Island, collected by Cox, has been seen by Prof. Fernald in herb. New Brunswick Natural History Society; and material collected by Cox on Portage Island and at Tracadie has been examined by the writer. It is also in the Gray Herbarium from St. Andrews, 1909, *Klugh* 14.

Lechea intermedia Leggett. Portage Island (5672); Fox Island (5690); Richibucto (5709); Kouchibouguac (5727). Listed by Fowler (p. 16), as *L. minor*, from "Kouchibouguac Beach, Goat Island in Grand Lake, *Fowler; Hay*, Herb.; Hopewell, *Brittain.*"

Oenothera pumila L. var. rectipilis Blake, Rhodora xix. 110 (1917). Type from Petit Rocher (5513). Fowler (p. 29) records *O. pumila* from "Bass River, *Fowler;* near St. John, *Hay*, Herb." The varietal identity of these specimens remains in doubt. Specimens in the Gray Herbarium from Shediac Cape, 1914, *Hubbard*, belong to true *O. pumila.*

Chimaphila umbellata (L.) Barton var. cisatlantica Blake, Rhodora xix. 241 (1917). Type from Bathurst (5435). Fowler (p. 43) lists it, under name *C. umbellata,* as common.

Kalmia angustifolia L. Coniferous woods, Bathurst (5413). A woodland form with leaves somewhat broader than usual, not revolute, and green beneath. I have also collected this form in coniferous woods at Cherryfield, Maine (*Blake* 4000 in part), but have not yet found it fruiting.

Limonium trichogonum Blake, Rhodora xviii. 61. t. 119, f. E (1916). Type from Loggieville (5624); also collected on Neguac Island (5666). Fowler (p. 44) lists this species, under *Statice Limonium* var. *caroliniana,* as "common in salt marshes round the coast."

Samolus floribundus HBK. Bank of French Fort Cove, Miramichi River, Newcastle (5628). Fowler (p. 45), under *S. Valerandi* var. *americanus,* says: "muddy shore of a small brook at Kouchibouguac, only place I have noticed it." In herb. Miramichi Nat. Hist. Soc., at Chatham, I found specimens from "Salmon Hatchery, N. W. Mir., 1901, *MacIntosh & Cox.*"

Teucrium canadense L. var. littorale (Bicknell) Fernald. In sand, Neguac Island, 16 September (5667). First definite record for

New Brunswick. Fowler (p. 52), whose record has not been incorporated in our manuals, lists what was probably this form, as *T. canadense,* from "sand beach, Kouchibouguac."

Galeopsis Tetrahit L. (See Fernald & Wiegand, Rhodora xii. 141–142 (1910).) Edge of pasture, Bathurst (5466). Corolla white.— The commoner form, var. *bifida* (Boenn.) Lej. & Court., was also collected at Bathurst, in a cultivated field (5479).

Linaria minor (L.) Desf. Along Intercolonial Railway Petit Rocher (5487). Recorded by Fowler (p. 10) from "Ballast Wharf, St. John, *Hay*, 1881;" and by Fernald & Wiegand (Rhodora xii. 142 (1910)) as abundant at Fairville.

Galium trifidum L. var. halophilum Fernald & Wiegand, Rhodora xii. 78 (1910). Inner edge of brackish flats, Bathurst (5402); sand bar, sandy beach, and wet sands back of beach, Miscou Harbor (5560, 5575, 5581); sandy beach, Tracadie (5637).

Aster laurentianus Fernald var. contiguus Fernald, Rhodora xvi. 60. t. 109. f. 5 (1914). Type and only known collection from Tracadie (5645).

Aster subulatus Michx. var. obtusifolius Fernald, l. c. 61. t. 109. f. 6. Type from Bathurst (5372); also collected there by Williams & Fernald in 1902.

Antennaria canadensis Greene. Bathurst (5384). The only *Antennaria* met with.

Achillea Ptarmica L. Grassy roadside, Bathurst (5432). Considered by Gray (Syn. Fl. i. pt. 2. 363), on the basis of Fowler's specimens (see List, p. 38), as "apparently indigenous in Restigouche and Kent Counties."

Sonchus arvensis L. var. glabrescens Wimm. & Grab. (See Fernald & Wiegand, Rhodora xii. 145 (1910).) Sandy shore of Nepisiguit Bay, Bathurst (5395).

Gray Herbarium.

THE DIAGNOSTIC CHARACTER OF VALLISNERIA AMERICANA.

M. L. Fernald.

It has become so fixed a tradition in North America that our fresh-water Eel Grass or Tape Grass is *Vallisneria spiralis* L. that very few students of our flora have made a critical comparison of the American plant and the true *V. spiralis* of Europe. The European species is found only from the Mediterranean region northward into southern and southeastern Europe and adjacent Asia, not in the northern portions of the continent nor the British Isles, and therefore, as an essentially Mediterranean species, is not to be expected as a widely distributed plant of temperate eastern North America. Our own plant is found in fresh waters from central Maine to South Dakota and south to Florida and the Gulf States. In 1803 Michaux described the North American plant as a distinct species, *V. americana*, as follows:

"AMERICANA. V. foliis erectis: pedunculis non spiralibus.
Obs. Folia minus quam in *spirali* elongata, stantia, inferne non angustata.
Hab. In flumine *Mississipi* et in fluvio *S. Joannis* Floridae." [1]

Subsequent authors for some years took up *V. americana* as distinct but added nothing particularly significant to the description until Nuttall in 1818 stated that the male peduncles are "very short" but that the plant is "Apparently a mere variety of *V. spiralis*." [2] In 1826 Torrey definitely treated the American plant as a variety, calling it *V. spiralis, β americana* and again stating the character pointed out by Nuttall, "sterile peduncles very short." [3] After Torrey's publication the varietal designation was soon dropped and our plant has subsequently been treated as quite identical with the European. It is not perfectly clear that Nuttall and Torrey, in speaking of the short peduncle of the staminate inflorescence, were contrasting it with the peduncle in the European for they may have intended merely a contrast with the long peduncle of the pistillate flower which becomes in fruit more or less spiralled.

[1] Michx. Flor. Bor. Am. ii. 220 (1803).
[2] Nutt. Gen. ii. 230 (1818).
[3] Torr. Compend. 365 (1826).

Examination of European specimens and of European plates shows at once that, as would be expected, there is a very definite difference between the European and American plants. In the staminate inflorescence the pouch or spathe of the European plant, as shown in all good European specimens and illustrations, is borne upon a slender filiform scape, which in maturity is 1.6–7 cm. long and only 0.5–1.2 mm. thick, and the spathe itself is ovoid, strongly rounded at base and only 6–9 mm. in length. The staminate spathe in the American plant is often nearly sessile, but more often on a short club-shaped thick scape 0.2–2 cm. long and 1.5–3 mm. thick, the spathe itself being much larger than in the European, 1–1.6 cm. long, and narrowed gradually into the thick scape. This pronounced difference in the staminate inflorescences is constant in all material examined which has been in condition to display the character, although definite diagnostic characters in the pistillate flowers and fruit have not been found. It would seem, however, in view of the striking differences in the staminate inflorescences, that we should recognize *Vallisneria americana* Michx. as the common American plant.

Very recently Rydberg[1] has revived *V. americana*, but not in the sense of the present writer, for Rydberg has treated the common North American plant as quite identical with the European *V. spiralis*, citing various European illustrations as representing it and treating *V. americana* as a local species found from "Florida to Mississippi" with the type locality "Mississippi River." Rydberg attempts to separate the southern plant, which he calls *V. americana*, from the widely dispersed species on the following characters:

Stigmas 2-cleft for less than half their length; sepals 2–3 mm. long; pistillate peduncles usually spiral-twisted in fruit; leaves 3–8 mm. wide. 1. *V. spiralis*.

Stigmas 2-cleft to near the base; sepals 5–6 mm. long; pistillate peduncles scarcely spiral-twisted in fruit; leaves 6–20 mm. wide...2. *V. americana*.

The writer has not seen sufficient material from the Gulf States to feel confident that the stigma-characters indicated by Rydberg are important, but such material as he has before him shows a plant from Florida (*Hitchcock*, no. 376) with sepals only 3.5 mm. long (instead of 5–6 as Rydberg requires for the Florida plant) and material from Mississippi (*Skehan*) with leaves 5–7 mm. broad (instead of 6–20 mm. as required of the Mississippi plant by Rydberg), while among the

[1] Rydb. N. A. Fl. xvii. 68, 69 (1909).

northern specimens it is frequent to find sepals 5 mm. in length (Rydberg restricts the sepals of the northern plant to a length of 2–3 mm.) or the leaves well over 1 cm. broad (for example *Gleason* and *Shobe*, no. 184 from Illinois, with leaves 12 mm. broad). It does not seem very probable that there are two American species; at any rate, most of the characters stated by Rydberg are thoroughly inconstant and it is very certain, if Michaux's *V. americana* is typified by his plant from the Mississippi River, that the type did not come from the range "Florida to Mississippi" assigned to *V. americana* by Rydberg. The Mississippi River known to Michaux was entirely in western Illinois, Michaux making his trip to the Mississippi in 1795–96 and exploring along the Mississippi in Illinois southward as far as the mouth of the Ohio, thence along the Ohio and tributary rivers eastward. Any material of *V. americana* which he collected in the Mississippi River must, then, have come from Illinois, and *V. americana*, if it rests alone upon the Mississippi River material, is clearly the common species of the North and not a different plant which may or may not exist in the Gulf States. From what has been stated, it is clear that our American *V. americana* differs very definitely from the southern European species, *V. spiralis*, in its staminate inflorescences and that treated as a species it is *V. americana* Michaux, or as a variety it would be *V. spiralis*, var. *americana* (Michx.) Torr.

Gray Herbarium.

Josselyn Botanical Society of Maine.—The Twenty-fourth Annual Field Meeting will be held at Phillips, July 2, 1918, with headquarters at the Willows Hotel. Further notice will be sent to members, and to others interested, on request, at least two weeks previous to the meeting.—Miss Adaline Willis, Secretary, Naples, Maine.

SPIRANTHES IN DOVER, MASSACHUSETTS.

Harold St. John.

Several times during the last twelve years the writer has collected from a grassy field forming part of his grandmother's farm in Dover, Massachusetts, specimens of a big grass-leaved *Spiranthes*. It proves to be *S. vernalis* Engelm. & Gray. By the margin of a few miles this is a new most northern station for the plant. The nearest record being that from Randolph: sandy roadside, Canton Road, Sept. 5, 1898, *J. R. Churchill.*

From the first the writer had difficulty in identifying these specimens, because the lip did not really seem to be "pubescent beneath." In those earlier years his instinctive reverence for the exact truth of all words appearing in a book, especially a botany, made the finder realize that either his eyes or the plants themselves were at fault and made him force himself to see the lip as "pubescent beneath." When last summer this plant was again collected, the discrepancy was still apparent, and this time he was in a position to consult original sources, other collections, and to review all the evidence.

Because of his own difficulties when studying this species and in the hope of helping other botanists, the writer makes a few comments on its description in the current manuals. In Prof. Ames's treatment in Gray's Manual, ed. 7, 313 (1907) the key-character leading to this species is,

"++ *Lip ovate to ovate-oblong, pubescent beneath.*"

The lip of this species is from ovate to ovate-oblong in shape, but it cannot be accurately described as "pubescent beneath." Between the two nipples on the upper side of the lip is a long white villosity. This grades off into a fine puberulence which in the immediate neighborhood of the callosities covers the upper surface of the lip, the margins and to a slight extent runs over on to the lower surface immediately beneath the callosities.

The leading phrase in the key in Britton & Brown's Illustrated Flora, i. 564 (1913) is equally inapplicable.

"Lip pubescent without, of an ovate type, the base dilated."

On the same score this also fails to describe the real condition, and one having the actual plant before him would have difficulty in identi-

fying it properly. Both of these treatments follow closely that of Prof. Ames in his "Synopsis of the Genus Spiranthes North of Mexico," Ames: Orchidaceae, Fasc. i. 124 (1905) where he used a similar statement in his key:

"Lip ovate to ovate-oblong, usually equalling the sepals and petals; not laciniate at the tip, broadest in front of the callosities, pubescent beneath."

The amount and position of the pubescence on the lip of this species is well represented in an enlarged drawing on a sheet of the type number (*Lindheimer*, no. 191) in the Gray Herbarium; and in Plate 51, fig. 5, Rhodora, vi. 31 (1904). This plate, drawn by Mrs. Ames, illustrates this species in an article written by Prof. Ames in which he described it as *S. neglecta* Ames.

After further study and the inspection of additional material Prof. Ames decided [1] that his *S. neglecta* was identical with and would have to be placed in the synonymy of *S. vernalis* Engelmann & Gray. If the pubescence on the lower surface of the lip of *S. vernalis* is to be used as a key character to separate it from the more southern *S. praecox* (Walt.) Wats. & Coult., then the small quantity and definite localization of this pubescence should be stated. The lips of both these species are, when seen with considerable magnification, finely papillose, but this would not conceivably be confused with pubescence. The callosities of *S. praecox* are cylindrical, longer, and more divergent than those of *S. vernalis.*

In the large sloping field on the north side of Farm St., Dover, where these plants were growing, *S. gracilis* (Bigel.) Beck was abundant and growing intermingled with *S. vernalis.* There were also some plants with the grass-like leaves and the yellowish-white tinge of the corolla and the puberulent summit of the culm of *S. vernalis;* but with the more slender habit, the more slender spike with fewer looser spirals, and with the smaller corolla of *S. gracilis.* In these the lip is quite intermediate in character. It resembles that of *S. gracilis* in size and in its crisped outer margin. It has a suffusion of yellowish-green color down its centre and in the callosities, suggestive of the deep green color of the body of the lip of *S. gracilis.* The lip is narrower, being oblong (3 mm. in width) while the lip of *S. gracilis* is quadrate (4 mm. in width).

[1] Ames, Oakes: Orchidaceae, Fasc. i. 113–7 (1905)

Another collection of this puzzling plant (*St. John*, no. 2,046) showed likewise a blending of the characters of *S. vernalis* and *S. gracilis*, but in this case they were combined differently. The specimens resemble *S. gracilis* in the size of the corolla and the quadrate shape of the lip; they resemble *S. vernalis* in having the summit of the culm pubescent as in that species; they show characters intermediate between those of the two species in that the lip is partially suffused with green and is somewhat crisped at the margin, while the spirals of the spike are fewer and more distant than in *S. gracilis* but not as much so as in *S. vernalis*. These plants are without doubt of the same nature as those collected at Easton, Massachusetts, and described as *S.* × *intermedia* Ames.[1] As in Dover, the plants in Easton were growing in the immediate proximity of the alleged parents, *S. gracilis* and *S. vernalis*.[2] The second occurrence of this natural hybrid, at a different station is a noteworthy bit of evidence towards Prof. Ames's suggestion that this apparently fertile hybrid may rapidly establish itself as a distinct species. There is every reason for the supposition that at this second known station the crossing has again occurred, instead of the supposition that the plant has spread from the original station at Easton.

Close observation and study of these specimens from Dover in the fresh condition seems to confirm Prof. Ames's statement [3] that "*Spiranthes* × *intermedia* is a non-Mendelian hybrid. It is intermediate throughout, the characters of both parents being merged in all the important vegetative and floral parts."

In order to bring out any relation between the location of the hybrid plants and those of the parent species, the writer made a census of their occurrence in this part of Dover. Mrs. Everett's field in which *Spiranthes vernalis* has grown for at least twelve years is nothing but a rather dry hayfield on a gentle south slope in the western and higher part of Dover. A definite ridge running across it divides this six acre field into two nearly equal parts, one to the west, and one to the east, which is lower, with a definite gully running through it. This

[1] Rhodora, v. 262 (1903).

[2] Prof. Ames originally described *S.* × *intermedia* as a hybrid of *S. gracilis* (Bigel.) Beck and *S. praecox* Watson, but he later demonstrated [Ames: Orchidaceae, Fasc. i. 113–21 (1905)] that the northern plant which he had called *S. praecox*, should be treated as *S. vernalis* Engelm. & Gray. Hence the hybrid × *S. intermedia* Ames is to be considered as one between *S. gracilis* (Bigel.) Beck and *S. vernalis* Engelm. & Gray.

[3] Rhodora, v. 263 (1903).

eastern section of the field is moister and produces a more luxuriant stand of grass and a larger number of the *Spiranthes.* In the thorough search it was discovered that these orchids also occurred in a nearby, but not contiguous, hay field belonging to Mr. Gardner. Mrs. Everett's field has to the author's certain knowledge been continuously cultivated for over fifty years, and probably much longer than that, for it has been in the possession of the same family for five generations. One would never think of inspecting such fields as these in search for orchids. It is of course their late blooming that allows them to exist here. After the hay has been cut, they send up their stalks and come into flower undisturbed about the first week of September. How the plants survive the occasional plowing is more of a mystery. The relative abundance of these plants in the three areas is brought out in the following table.

Species	Number of plants in western part of Everett field.	Number of plants in eastern part of Everett field.	Number of plants in Gardner field.
S. vernalis.	1	44	38
×*S. intermedia.*		9	1
S. gracilis.	36	295	19

In the eastern part of the Everett field both of the species *S. gracilis* and *S. vernalis* are not only more abundant than in the other localities, but they grow much closer together. Hence in this area a visiting bee would have a greater chance of making a mistake and, with the boat-shaped scale together with its attached pollinia of one species glued to his proboscis [1] he would occasionally fly to the lowest flower of a spike of the other species. Here he would climb up the spiral flowery staircase stopping at each landing to sip of the nectar and fertilize the stigma with the foreign pollen that would give rise to more plants of × *Spiranthes neglecta* Ames.

Gray Herbarium.

[1] For a description of the method of the cross fertilization of the flowers of this genus and of *S. gracilis*, see Darwin, Charles: Fertilization of Orchids by Insects, 2nd ed. 105–14 (1877): and Robertson, Charles: Flowers and insects. ix., Bot. Gaz. xvii. 51–2 (1893).

PLANTS FROM SOUTH WEYMOUTH, MASSACHUSETTS.

CLARENCE H. KNOWLTON.

GREAT POND is a moderate-sized sheet of fresh water, perhaps a mile long. It lies in the southwestern part of Weymouth, bordering on Abington. As various coastal-plain plants have been reported there, I visited the region somewhat briefly on October 14, 1917. My first collection of interest was *Rynchospora macrostachya*, var. *inundata*, previously found here with the species by E. and C. E. Faxon and others (RHODORA, xiii. 105, 1911). I did not find much of the variety, and none of the species. There were also a few fruited plants of *Sabatia Kennedyana* Fernald, and a good many fruited specimens of *Rhexia virginica*, in moist shore gravel.

The most exciting discovery was a large rather dense colony of *Panicum debile* Ell. (*P. verrucosum* Muhl.), a very interesting species which has the second glume and sterile lemma warty or verrucose. It grew luxuriantly in moist sandy soil near the pond. This is the first report of this grass north of Kingston, so this is an addition to the Boston Local Flora. It was first found at Plymouth by William Oakes, and for many years this was the only known New England station. It has recently been rediscovered at Plymouth, and there are specimens from Kingston, Carver, Lakeville, Barnstable, Yarmouth and Dennis in the New England Botanical Club Herbarium. Mr. Luman Andrews and others have found it at several stations in Springfield. Prof. J. F. Collins and Prof. M. L. Fernald have found it at Hopkinton, R. I., and Mr. E. B. Harger at New Haven, Conn.

Another plant of much interest was *Cuscuta compacta*, which was abundant on twigs of *Acer rubrum* and *Clethra alnifolia*. On the latter it formed spirals on stems one centimeter and more in diameter, "the ripening capsules capped with the marcescent corolla." Another common shrub near the pond is *Leucothoe racemosa*.

Further circuit of the pond shores ought to reveal other attractive plants. To any Boston botanist wishing an afternoon with coastal plain species I recommend a trip to this easily accessible region.

HINGHAM, MASSACHUSETTS.

Some Rhode Island Grasses.— The following grasses appear to be new to the recorded flora of Rhode Island.

Puccinellia paupercula alaskana.[1] This plant occurs at Westerly, where it is the prominent grass on a large, sand-coated marsh, growing with *Spergularia leiosperma, S. salina, Suaeda linearis* and other saline species.

Panicum virgatum cubense. This variety occurs associated with the species at Westerly. Mrs. Agnes Chase, who has kindly examined specimens from Westerly, states that they are exactly like Graves, 244, Groton, Connecticut, August 16, 1901.[2] Both have the narrow panicle and small spikelets of var. *cubense,* but the glumes and sterile lemma are more pointed than in characteristic var. *cubense* from New Jersey southward. Mrs. Chase adds that they are, however, nearer to the variety than they are to the species.

Panicum oricola. This species is abundant in Westerly at several stations along the shore of the Sound. Specimens have been verified by Mrs. Chase.— R. W. Woodward, New Haven, Connecticut.

A New Variety of Triosteum aurantiacum.— In central New York there are two well marked forms of *Triosteum aurantiacum* which do not seem to intergrade to any appreciable extent. Both are about equally common. The two types differ in the lower surface of the leaves as follows: typical form of the species, leaves densely velvety-canescent beneath.

Var. **glaucescens**, var. nov., foliis subtus glabris aut ad venas sparse pilosis.

Leaves glabrous beneath or sparsely pilose along the veins.— Common in central New York. The only other specimen seen is from "South Mountain above Penryn, Lebanon County, Pennsylvania, May 1891" *Heller & Halbach.* Type (in herb. N. Y. State Col. of Agric. Ithaca): rich bottomland, Paine's Creek, Ledyard, Cayuga County, New York, June 20, 1916, *K. M. Wiegand*, no. 7196.

In 1836, Rafinesque (New Flora N. A. Pt. 2, p. 35–37) published six new names in *Triosteum* but I cannot definitely ascribe any of these either to *T. aurantiacum* or the present variety, though probably Rafinesque had at least one of these plants in hand.— K. M. Wiegand, Cornell University.

[1] Fernald & Weatherby, Rhodora, xviii. 18 (1916).

[2] North American Panicum, Hitchcock & Chase, Contrib. U. S. Nat. Herb. xv. 92 (1910).

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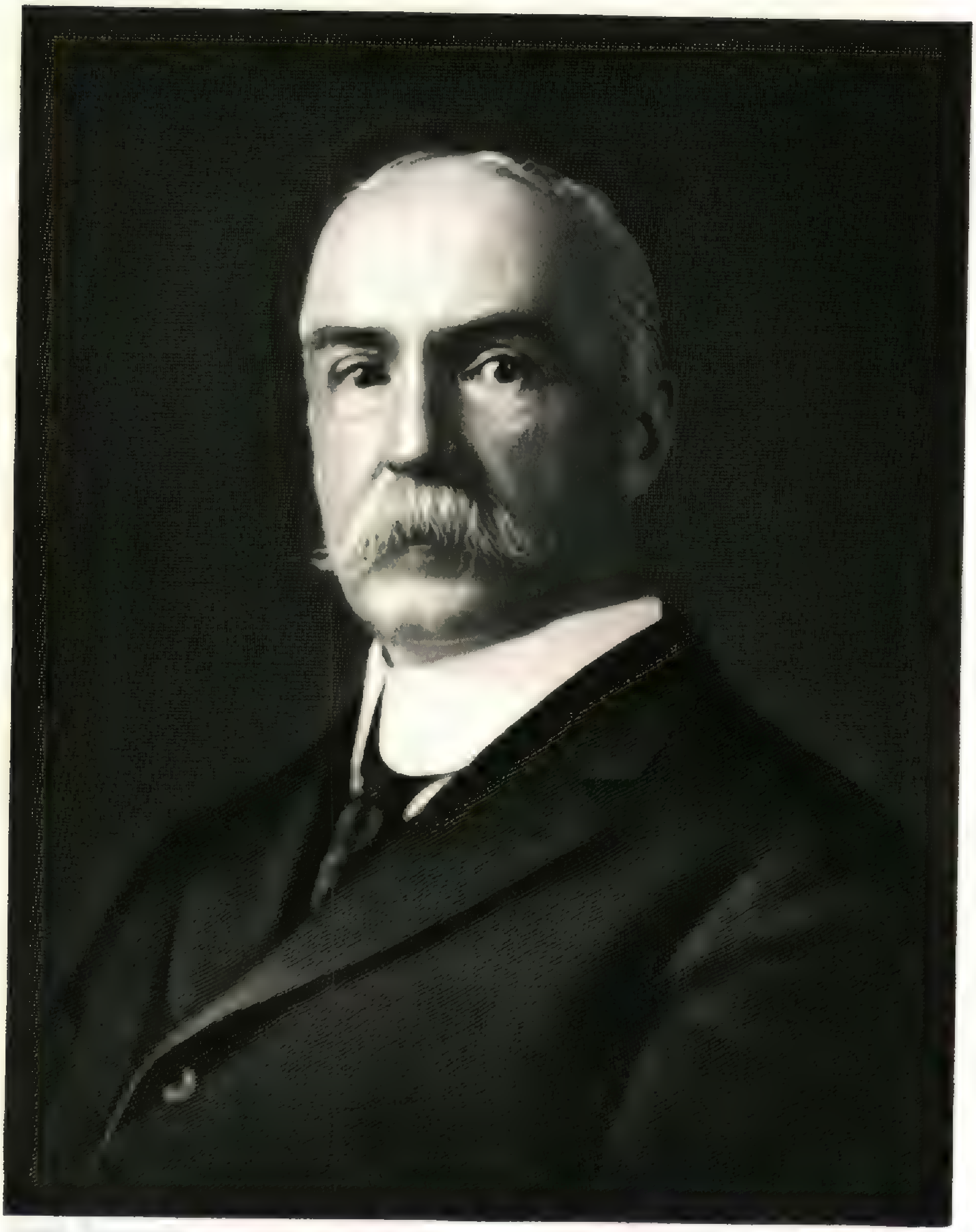

C. E. Faxon

Rhodora

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CHARLES EDWARD FAXON.

C. S. Sargent.

(With portrait.[1])

Charles Edward Faxon died at his home in Jamaica Plain on the 6th of February, 1918. He was born in Jamaica Plain, then a part of the town of Roxbury, January 21, 1846, and was the son of Elisha and Hannah Mann (Whiting) Faxon. Elisha Faxon was a direct descendant in the eighth generation from Thomas Faxon who came from England to America about 1647 and settled in Braintree, Massachusetts. The father died when Charles was nine years old and the oldest son of the family, Edwin,[2] took his place and exercised a wise influence on the younger children. Under his guidance Charles and his youngest brother Walter learned to love Nature. With him they roamed the fields and woods in what is now Greater Boston which sixty years ago were full of interest for the lovers of Nature. He taught them to look at trees, to gather and observe flowers, to watch birds and collect their eggs, and it is probable that the two boys would never have become distinguished in science without this brother's inspiration and guidance. The Faxon family was a remarkable one even for New England in the middle of the last century. The children were taught music, and constantly attended the best concerts and the opera. They studied French at home and as children read it fluently, and no effort was spared for their intelligent education. As a child

[1] For permission to use the plate from which the portrait of Mr. Faxon is printed Rhodora is indebted to the courtesy of the Massachusetts Biographical Society.

[2] See Rhodora, ii. p. 107.

Charles Faxon taught himself to draw, using as his model the studies of landscape and of trees published by J. D. Harding, an English artist, in his *Lessons on Trees* and other books which in their time were influential in increasing the love of drawing. By the time he was fifteen years old Charles Faxon was able to make excellent copies in color of some of Audubon's birds, and during the summers made successful pencil and water color sketches of the scenery of northern New England.

What Faxon learned from schools was in the Jamaica Plain public schools and the Lawrence Scientific School at Cambridge, from which he was graduated as a civil engineer in 1867. At Cambridge he was noted for skill in mechanical drawing. Later he became deeply interested in English literature and taught himself to read nearly all the modern European languages. After graduating from the Lawrence Scientific School he was a clerk for a short time in the firm of leather merchants established by his father and conducted by two of his older brothers. During this time he made a journey among the mountains of western North Carolina, and in 1876 he passed six months in Europe, visiting Great Britain, France, Italy, Germany and Switzerland.

Faxon lived always in Jamaica Plain and did not care to travel except in western and northern New England where he spent a few weeks every spring and autumn, his last journey to northern New Hampshire having been in the autumn before he died. Berkshire County, Massachusetts, was a favorite field of the Faxons and they knew its flora well, as they did that of the Green Mountains of Vermont and of all northern New Hampshire. Outside of New England Faxon traveled little and never crossed the continent. In the spring of 1883 he passed a few weeks at Mobile, making sketches of some of the southern trees for The Silva, and in the winter and spring of 1885 he visited with me several of the West Indian islands in the hope of obtaining material of some of the West Indian trees which grow also in southern Florida. On this journey we returned by the way of New Orleans and went as far west as San Antonio, Texas. In April of the next year he visited with me the Florida Keys on one of the steamers of the United States Lighthouse Service and at this time made a large number of drawings. This was the last of Faxon's journeys beyond New England.

From 1879 to 1884 Faxon was an instructor of botany in the Bussey Institution of Harvard College. He was a Fellow of the American

Academy of Arts and Sciences, and in 1897 Harvard conferred on him an Honorary Master of Arts degree.

During the 70's Professor D. C. Eaton was preparing an illustrated work on the Ferns of North America and the Faxons, who were interested in Ferns, had opportunities for collecting northern material for him. This led to an invitation to Charles Faxon to make some of the colored drawings for Eaton's book. The first of these, that of *Aspidium Goldianum* Hook., was published in June 1879, and is plate xl. of volume i. The remaining plates of this volume and all those of volume ii. were drawn by Faxon.

Professor Spencer F. Baird, one of whose earlier papers was a catalogue of the trees and shrubs of Cumberland County, Pennsylvania, was anxious that the Smithsonian Institution should publish a Silva of North America, and as early as 1849 Isaac Sprague began to make colored drawings of the flowers and fruits of trees under the direction of Asa Gray who was to prepare a North American Silva for the national Government. This plan was dropped at the end of a few years, but in 1882 I accepted Professor Baird's invitation to undertake the preparation of a Silva of North America to be published by the Smithsonian Institution, and I asked Charles Faxon to join the Arboretum staff to take charge of the herbarium and library, and to make the drawings for the new Silva. He came to the Arboretum on May 12th of that year and remained in charge of the herbarium and library until his death, seeing them grow from insignificance to considerable importance; and much of the value and success of the Arboretum is due to the admirable manner in which he managed his departments.

Faxon began at once the drawings for The Silva, but at the end of a few months it was found that at the rate the Smithsonian Institution was willing to pay for the work it would take at least seventy-five years to complete it, and another arrangement was made for the publication of the book. Under the new arrangement Faxon made such good progress with the drawings that it was possible to begin publishing the first volume in 1891, and the last of his seven hundred and forty-four Silva plates appeared just twenty-one years after he began making the first drawing.

To illustrate some of the Guatemala plants described by John Donnell Smith Faxon made thirty-four drawings which were published in *The Botanical Gazette* between 1888 and 1894. They repre-

sent previously undescribed species and are accompanied by complete analyses of flowers and fruits. Four of this set are of new species of Ferns. These plates with others illustrating the flora of Guatemala were issued on large paper by Mr. Smith in 1906. In this set of thirty-four drawings are found some of the best examples of Faxon's work.

In the ten volumes of *Garden and Forest* (1888–1898) are published two hundred and eighty-five of Faxon's drawings. Among them are eight drawings of insects and their destructive work. Among the plants there is a large variety of subjects, including trees, shrubs, herbaceous plants and Ferns. Many previously undescribed species and one genus (*Robinsonella*, named in honor of the editor of this Journal) are found among these drawings. Among them, too, will be found the first illustrations of several plants which have now become common in gardens, and the only illustrations which have been published of many rare and interesting North American shrubs. Among these drawings are figures of thirteen North American species of Aster, Irises, Phloxes, Barberries, and a number of Japanese trees and shrubs. Seventeen of these illustrations of Japanese trees were reproduced in Sargent's *Forest Flora of Japan.*

In the two volumes of *Trees and Shrubs* (1902–1913) two hundred of Faxon's drawings are published. They illustrate new or little known ligneous plants, including two previously undescribed genera, *Faxonanthus* in honor of Edwin Faxon, and *Grypocarpa*, and one hundred and three previously undescribed species, principally from North America, Mexico, Central America, China and Japan.

In 1905 six hundred and forty-two of Faxon's drawings were published in Sargent's *Manual of the Trees of North America*, and in the last year of his life he was at work on some additional drawings for a new edition of this work. Between 1899 and 1913 thirteen of Faxon's drawings were published in *Rhodora*, and three of his drawings of Ferns will be found in the *Bulletin of the Torrey Botanical Club.* During thirty-four years, from 1879 to 1913, nineteen hundred and twenty-five of Faxon's drawings were published.

Faxon never cared to write for publication. His modesty, I think, deterred him from sharing with the public the information on many subjects of which he was master, and I can find only the following from his pen: On page 52 of the second volume of *Garden and Forest* there is a translation by him of a part of Professor Coutinho's paper

Os Quercus de Portugal, published in volume vi. of the *Boletin da Sociedade Broteriana,* on the fructification of the Cork Oak. On page 140 of the fourth volume there is an account by him of *Viaggio negli Stati Uniti dell' America Septentrionale fatto negli anni 1785, 1786, e 1787,* da Lugi Castiglioni. *Con alcune osservazioni sui Vegetabili* etc., a work which had been overlooked by American botanists; on page 292 of volume viii. will be found an article on the *Birds of the Arnold Arboretum* with lists of summer and winter residents; and on page 464 of the ninth volume there is a short note by him on *Aster infirmus* Michaux to accompany his illustration of that species which he had found growing in abundance at Lexington, Massachusetts. Of more importance is his translation from the Danish of an article on Wisconsin birds by the Danish ornithologist Grundtvig.[1] He contributed to *A Guide of the Arnold Arboretum* the chapter on birds. If Faxon wrote little his good taste, knowledge of languages and good judgment were always at the command of his associates, to whom for thirty years he rendered invaluable services in the careful and critical examination of their proof-sheets.

In his drawings Faxon united accuracy with graceful composition and softness of outline. He worked with a sure hand and great rapidity, and few botanical draftsmen have produced more. Certainly none of them have drawn the flowers, fruits and leaves of as many trees. Among the very few who in all time have excelled in the art of botanical draftsmanship Faxon's position is secure, and his name will live with those of the great masters of his art as long as plants are studied.

Faxon never lost his interest in reading or in Nature, and although he lived alone he had too many resources to be lonely. In all the years I knew him he was never sick, and only once was kept at home for a few days, the result of a fall on the ice. He was absolutely free of jealousies, and, although in temperament he was not sanguine and too often had unnecessary forebodings of trouble, his life was a happy one. He enjoyed to the end the long country walks to which, with his brothers, he had become accustomed as a boy; and to him a summer day in New England, when trees, birds and flowers taught him new

[1] *On the Birds of Shiocton in Bovina, Outagamie County, Wisconsin, 1881–83,* by F. Grundtvig. Translated by Charles E. Faxon from the *Videnskabelige Meddelelser fra den Naturhistoriske Forening i Kjøbenhavn for Aaret,* 1887, pp. 305–396, and published in the *Transactions of the Wisconsin Academy of Sciences, Arts and Letters,* x. pp. 74–158. Issued March, 1895.

lessons, or renewed old memories, brought pleasures which only the true lovers of Nature can understand. And he died, as he had often expressed the wish to die, suddenly and painlessly.

To those who knew Charles Faxon best he has left the memory of a modest, kindly, unselfish gentleman whose life was inspiration and help to us all.

Arnold Arboretum.

SOME NEW SPECIES AND VARIETIES OF POA FROM EASTERN NORTH AMERICA.

M. L. Fernald and K. M. Wiegand.

During the course of studies of the flora of northeastern North America the genus *Poa* has been found to be in great need of critical investigation, and the two following species are here proposed as partly clarifying the confusion which has so long existed in the series of plants passing as *P. debilis*, *P. sylvestris* and *P. alsodes*. The plants have heretofore been variously referred to these species, and sometimes one of them has been confused with *P. autumnalis*. The first is a common woodland species of the region from Newfoundland and southeastern Canada into the northeastern states and as a characteristic woodland plant may be called

Poa **saltuensis**, n. sp., caespitosa; culmis tenuibus 2–8.5 dm. altis basi foliosis, nodis caulinis 2–4 remotis; foliis 2–5 mm. latis imis elongatis caulinis brevibus laminis quam vaginis brevioribus marginibus laevibus vel ad apicem scabriusculis, ligulis superioribus 0.3–1.5 mm. longis plerumque erosis; paniculis primariis 0.6–2 dm. longis nutantibus secundis, ramis filiformibus adscendentibus nutantibus plus minusve scabris ad apicem floriferis, mediis imisque plerumque binis rare solitariis vel ternis; spiculis 3–5-floris 3.5–5.5 mm. longis; glumis subaequalibus acutis quam lemma proximum quartam partem brevioribus glabris; lemmatibus 3.2–4 mm. longis acutis basi arachnoideis supra glabris viridibus vel rare purpurascentibus, margine anguste hyalinis, nervis marginalibus intermediisque prominentibus; antheris 1–1.2 mm. longis flavescentibus; caryopsibus ellipsoideo-fusiformibus fulvis 2–2.5 mm. longis.

Caespitose: culms slender, 2–8.5 dm. tall, leafy at base; the cauline nodes 2–4, remote: leaves 2–5 mm. wide; the lower elongate; the

cauline short, with the blade usually shorter than the sheath, smooth-margined or somewhat scabrous at tip; ligule of the upper leaves short, 0.3–1.5 mm. long, usually erose: primary panicles 0.6–2 dm. long, nodding and secund; the branches long and slender, ascending and widely nodding, more or less scabrous, spikelet-bearing near the tips, the middle and lower in 2's, very rarely in 1's or 3's: spikelets 3–5-flowered, 3.5–5.5 mm. long: glumes subequal, acute, about three-fourths as long as the nearest lemma, glabrous: lemmas 3.2–4 mm. long, acute, glabrous except the webbed base, green or rarely purple-tinged; margin narrowly hyaline; the marginal and intermediate nerves prominent: anthers 1–1.2 mm. long, yellowish: grain ellipsoid-fusiform, reddish-brown, 2–2.5 mm. long.—Woodland thickets and recent clearings, extending from eastern Quebec to western Ontario, southward to Nova Scotia, southern Maine, southern New Hampshire, central Massachusetts, Connecticut, New York, the mountains of Pennsylvania, and westward to northern Michigan. QUEBEC. Gaspé Co.: alluvial woods, Grand River, June 30–July 3, 1904, *Fernald;* wooded banks of River Ste. Anne des Monts, July 14, 1906, *Fernald & Collins*, no. 167 in part; wooded and alluvial banks, River Ste. Anne des Monts, July 14–16, 1906, *Fernald & Collins*, no. 357 (TYPE in Gray Herb.); calcareous alpine meadow at 1000–1100 m., Table-top Mt., August 7 & 12, 1906, *Fernald & Collins*, nos. 336, 338, 374; eastern syenitic slope of Table-top Mt., August 9 and 11, 1906, *Fernald & Collins*, no. 341. Rimouski Co.: damp woods, Bic, July 12, 1907, *Fernald & Collins*, no. 892. PRINCE EDWARD ISLAND. Prince Co.: dry clearing, Alberton, July 11, 1912, *Fernald & St. John*, no. 6904. Queens Co.: dry woods and clearings, St. Dunstan's, July 10, 1914, *Fernald & St. John* in Pl. Exsicc. Gray. no. 122. Kings Co.: open woods, Morell, June 29, 1914, *Fernald & St. John*, no. 10914. NOVA SCOTIA. Victoria Co.: Cold Brook, Sugar-loaf Mt., Aspy Bay, July 12, 1909, *J. R. Churchill.* Inverness Co.: moist woods, valley of the Barrasois River, July 25, 1914, *G. E. Nichols*, no. 326. MAINE. Aroostook Co.: common in woods, on gravelly shores, etc., St. Francis, July 17, 1898, *Fernald*, no. 2177; abundant in recent clearings, Masardis, June 8, 1898, *Fernald*, no. 2174; low woods, Masardis, June 8, 1898, *Fernald*, no. 2179; Presque Isle, July 14, 1902, *Williams, Collins & Fernald;* rocky woods, Mars Hill, July 14, 1893, *Fernald.* Penobscot Co.: mossy woods, Orono, May 30, 1889, May 30, 1890, *Fernald*, June, 1891, *F. P. Briggs.* Piscataquis Co.: Brownville, 1905, *J. C. Parlin;* abundant in rich woods, Foxcroft, June 6, 1898, *Fernald.* Oxford Co.: open woods, Canton, June 20, 1906, *Parlin*, no. 2062. Washington Co.: recent clearings, rare, Perry, July 9, 1909, *Fernald*, no. 1313. Cumberland Co.: rich woods, Scarboro, May 31, 1903, *Fellows & Fernald.* York Co.: North Berwick, June, 1892, *Parlin.* NEW HAMPSHIRE. Coös Co.: damp woods, Second Lake, Pittsburg, July 2, 1907, *Pease*, no. 10219; river-bank, Atkinson & Gilmanton Academy Grant, July 1, 1910, *Pease*, no. 12590; wooded

bank of Moose River, Gorham, July 28, 1915, *Pease*, no. 16362; alluvial woods by Moose River, Randolph, June 17, 1908, *Pease*, no. 11283; dry woods, Carroll, June 18, 1908, *Pease*, no. 11265; Oakes Gulf, Mt. Washington, July 8, 1895, *Faxon, Kennedy, Williams;* head of Oakes Gulf, July 21, 1909, *Pease*, no. 12087; Crawford Notch, June 7, 1878 and June 7, 1888, *Faxon.* Grafton Co.: Flume, Lincoln, June 28, 1855, *William Boott;* dry open woods, Woodstock, July 11, 1915, *Fernald*, no. 10557; Squam Lake, Holderness, June 8, 1886, *Faxon;* West Lebanon, May 29, 1894, *G. G. Kennedy.* Cheshire Co.: rocky woods, Barrett Mt., New Ipswich, June 5, 1896, *Fernald.* (This material formed the basis of the illustration of *P. alsodes* in Hitchcock's treatment of *Poa* in Gray's Manual, edition 7.) VERMONT. Lamoille Co.: summit of Mt. Mansfield, June 23, 1901, *T. O. Fuller.* Chittenden Co.: Burlington, May 30, 1895, May 31, 1897, *L. R. Jones;* Charlotte, June 2, 1877, *Pringle.* Orange Co.: swampy woods, Wells River, June 14, 1912, *C. H. Knowlton.* Windsor Co.: moist open field, Hartford, June 3, 1913, *C. H. Knowlton.* Rutland Co.: moist open woods, Brandon, May 26, 1917, *C. H. Knowlton.* Windham Co.: dry woods, Brattleboro, May 28, 1912, *L. A. Wheeler.* Bennington Co.: southeast slope, alt. 2500 ft., Mt. Equinox, Manchester, June 6, 1910, *J. A. Cushman*, no. 4387. MASSACHUSETTS. Middlesex Co.: near summit of Mt. Watatic, May 30, 1895, *T. O. Fuller.* Worcester Co.: Petersham, June 4, 1910, *G. G. Kennedy.* Franklin Co.: dry woodlands near Hoosac Tunnel, Rowe, June 24, 1913, *Fernald & Long*, no. 8786. Hampshire Co.: rich rocky woods, base of Mt. Holyoke, May 17, 1913, *Hubbard & Torrey*, no. 540. Berkshire Co.: Mt. Greylock, June 6, 1891, *W. P. Rich;* wet woods near Ice Glen, Stockbridge, July 3, 1906, *Ralph Hoffmann.* CONNECTICUT. Hartford Co.: stream-bank, Talcott Mts., May, 1879, *Charles Wright.* New Haven Co.: dry woods, Waterbury, May 28, 1912, *Blewitt*, no. 336, June 8, 1913, *Blewitt*, no. 1611. Litchfield Co.: dry woods, Salisbury, June 10, 1905, *Weatherby & Bissell*, no. 1482. NEW YORK. Tompkins Co.: rich woodlands near Round Marshes, Dryden, May 31, 1914, *F. P. Metcalf*, no. 1619. PENNSYLVANIA. Monroe Co.: rocky woods near Tannersville, May 30, 1902, *Canby.* Sullivan Co.: without locality, 1862, *C. E. Smith;* Union City, July 12, 1890, *Fernow.* ONTARIO. Thunder Bay District.: dry rocky ground, Current River, July 20, 1869, *J. Macoun;* dry woods, Nipigon, June 23, 1884, *J. Macoun.* MICHIGAN. Ontonagon Co.: Iron River, June 14, 1868, *H. Gillman.*

Var. **microlepis**, n. var., foliis angustioribus 1–3.5 mm. latis, ligulis superioribus brevissimis; paniculis primariis 3–11 cm. longis; spiculis 3–3.8 mm. longis plerumque 2-floris; lemmatibus 2.4–3 mm. longis.

Leaves narrower, 1–3.5 mm. wide; the upper ligules very short: primary panicles 3–11 cm. long: spikelets 3–3.8 mm. long, mostly 2-flowered: lemmas 2.4–3 mm. long.— Newfoundland to Maine and northern New Hampshire. NEWFOUNDLAND: wet clearings in spruce

woods along Gander River, Glenwood, July 12 & 13, 1911, *Fernald & Wiegand*, no. 4633 (TYPE in Gray Herb.); thicket by Birchy Pond Stream, East Branch of the Humber, July 11, 1910, *Fernald & Wiegand*, no. 2629; damp thicket near Goose Ponds, July 10, 1910, *Fernald & Wiegand*, no. 2630; dry bank of Steady Brook, marble region between Mt. Musgrave and Humber Mouth, July 15, 1910, *Fernald & Wiegand*, no. 2656; mossy brookside, Summerside, July 11, 1910, *Fernald & Wiegand*, no. 2627; brooksides and damp bushy ravines and subalpine thickets, limestone tablelands, alt. 200–300 m., Table Mountain, Port à Port Bay, July 16 & 17, 1914, *Fernald & St. John*, nos. 10786, 10787. QUEBEC. Gaspé Co.: dry woods, Grindstone, Magdalen Islands, July 22, 1912, *Fernald, Bartram, Long & St. John*, no. 6903; alluvial woods, River Ste. Anne des Monts, August 3–17, 1905, *Fernald & Collins*, July 14, 1906, *Fernald & Collins*, no. 167 in part. Bonaventure Co.: alluvial woods, Grand Cascapedia River, July 12–15, 1905, *Williams, Collins & Fernald;* arbor-vitae swamp, Carleton, July 24 & 27, 1904, *Collins, Fernald & Pease.* Quebec Co.: vicinity of Montmorenci Falls, July 28, 1905, *J. Macoun*, no. 69200. MAINE. Aroostook Co.: abundant in dry soil, Wallagrass, June 14, 1898, *Fernald*, no. 2175; ledgy shores and low thickets, Island Falls, June 9, 1898, *Fernald*, no. 2181. Penobscot Co.: low woods, Orono, June 23, 1893, *Fernald*. Piscataquis Co.: gravelly thickets and riverbanks, Sangerville, June 29, 1895, July 7, 1897, *Fernald;* wooded bank, Dover, June 28, 1894, *Fernald;* rocky woods, Brownville, June 22 & 28, 1905, *Parlin*, nos. 1865, 1869. Franklin Co.: Haley Pond, Rangeley, 1894, *Kate Furbish*. Androscoggin Co.: South Poland, 1893, *Kate Furbish*. NEW HAMPSHIRE. Coös Co.: alluvial woods of Dead Diamond River, Dartmouth College Grant, July 1, 1910, *Pease*, no. 12602; near Gorge of Diamond River, Dartmouth College Grant, July 1, 1910, *Pease*, no. 12625; dry wooded roadside, Pittsburg, July 10, 1917, *Pease*, no. 10082.

P. saltuensis is very similar in aspect to *P. debilis* Torrey, but the latter species has usually shorter, obtuse and much firmer chartaceous lemmas; broader glumes with mostly scabrous keels; longer cauline ligules (usually 2–2.5 mm. long); and smaller anthers (0.6–0.8 mm. long). *P. saltuensis*, var. *microlepis* has the spikelets as small as in *P. debilis*, but they maintain the acute lemmas and the anther-measurements of typical *P. saltuensis*, and the variety is decidedly more boreal. In distribution *P. saltuensis* is much more northern and eastern than *P. debilis*, the latter species extending from Vermont, Worcester Co., Massachusetts, and northern Connecticut through New York and Ohio to Michigan and Wisconsin. In central New York, where both species occur, *P. saltuensis* is found in the uplands associating with plants of boreal distribution, while *P. debilis* is a

species of lower levels near the lake-shores, where the flora is generally decidedly southern in aspect.

The second species here proposed is a small plant of boggy habitats which is abundantly distinct from the species to which it has heretofore been referred. This plant we propose as

Poa **paludigena**, n. sp., subcaespitosa vel vix caespitosa; culmis tenuibus 1.5–7 dm. altis laevibus vel superne minute scabris basi purpurascentibus, nodis 3–5; foliis angustis 0.25–2(–3) mm. latis laminis superioribus quam vaginis brevioribus vel rare eis aequalibus; ligulis brevibus truncatis superioribus 0.7–1.5 mm. longis; paniculis 0.3–1.3 cm. longis nec secundis valde laxis disjunctisque, ramis elongatis tenuibus vix flexuosis patentibus rare reflexis glabris vel minute scabris imis mediisque plerumque binis rarissime ternis ad apicem floriferis; spiculis 3–6 mm. longis 2–5-floris; glumis quam lemma proximum dimidio vel saltim quartam partem brevioribus; lemmatibus 2.5–3.5 mm. longis basi vix arachnoideis acutis vel acutiusculis apice scariosis plerumque purpurascentibus, nervis mediis marginalibusque pilosis plerumque infra medium, nerviis intermediis glabris obscuris; antheris 0.5–0.8 (rare –1) mm. longis.

Culms slender, 1.5–7 dm. high, subsolitary or in small tufts, smooth or minutely scabrous at summit, purplish at the base, without elongated root-stocks; cauline nodes 3–5: leaves narrow, 0.25–2 (rarely –3) mm. wide; blade of the upper shorter than or rarely equalling the sheath; ligules short, truncate, those of the upper leaves 0.7–1.5 mm. long: panicle 0.3–1.3 dm. long, not secund, very loose and open; branches long and slender, scarcely flexuous, widely spreading, rarely reflexed, glabrous or minutely scabrous, the lower and median chiefly in 2's, very rarely in 3's, spikelet-bearing above the middle: spikelets 3–6 mm. long, 2–5-flowered: glumes one-half to three-fourths the length of the nearest lemma: lemmas 2.5–3.5 mm. long, scarcely webbed at base, acute or acutish; the tip scarious-margined and often purple-tinged; midrib and marginal nerves pilose chiefly below the middle; the intermediate nerves glabrous and obscure: anthers very small, 0.5–0.8 (rarely –1) mm. long.— In bogs or boggy places, central New York, Michigan, Illinois and Wisconsin. New York. Tompkins Co.: in sphagnum, Mud Creek, Dryden, June 30, 1907, *Wiegand*, no. 7574. Wayne Co.: in sphagnum, Westbury bog, Butler, June 24, 1917, *Metcalf & Wiegand*, no. 7572 (type in Gray Herb.). Michigan: "this *Poa* found in sphagnous swamps in Michigan, nearest *P. flexuosa* Muhl.?" June 16, 1895, *C. F. Wheeler*. Illinois. Kane Co.: Elgin Swamp, *Vasey*. Wisconsin. Brown Co.: mossy cold springs, June 25, 1881, *J. H. Schuette*, no. 104; Upper Hill Creek in town of Ashwaubenon, June 25, 1881, *J. H. Schuette;* Duck Creek, Big Suamico, June 21, 1895, *J. H. Schuette.*

Related to *P. autumnalis* Muhl. and *P. reflexa* Vasey & Scribner. From the former it differs in the bog habitat, finer and less caespitose

habit, absence of hairs between the nerves of the lemma, the less prominent intermediate nerves of the lemma, and the much smaller anthers, those of *P. autumnalis* being 1.3–1.6 mm. long. From *P. reflexa*, *P. paludigena* is distinguished by the more slender, less caespitose habit, narrower leaves, shorter ligule and smaller spikelets. The anthers of the New York specimens were purple or violet when fresh; this may prove to be a constant specific character.

P. paludigena is apparently the plant described as *P. sylvestris* Gray, var. *palustris* Dudley, Cayuga Fl. 128 (1886). We have seen none of Dudley's material, but his description and the stations cited indicate *P. paludigena*, which, however, differs in many characters from *P. sylvestris*. The latter species has much broader leaves; stiffer longer panicles, with the more numerous branches strongly divergent and becoming reflexed; obtuse pubescent lemmas strongly webbed at base and with the midrib pilose to the tip and the median nerves prominent; and longer anthers (about 1.3 mm. long). The validity of the Linnean *Poa palustris* makes a new name necessary for *P. sylvestris*, var. *palustris* Dudley.

A NEW SPECIES OF BLADDERNUT.

J. Francis Macbride.

In the fall of 1917, Mr. H. C. Brigham of the Walding, Kinnan & Marvin Co., wholesale druggists of Toledo, Ohio, sent to the Gray Herbarium pods and leaves from one of three bushes of *Staphylea* which were growing in his garden of native plants and which he had transplanted from the woods some years before. In his first communication, dated Oct. 1, Mr. Brigham wrote as follows: "They [the shrubs] were very small, but grew rapidly, and one of them is now about twenty feet high, while the others are more than twelve feet in height. As soon as they began to blossom and bear fruit, I noticed a strong dissimilarity between one of them and the other two. These distinctions I will set down here as briefly as may be:

"The ordinary form has a large, oblong, bright green pod, usually somewhat wrinkled. The odd form has a much smaller, pear-shaped

pod, smooth, and brightly tinted on one or two sides with pink, darkening sometimes to maroon. The latter has almost always more seeds than the former, sometimes six or seven. It is a very beautiful and showy shrub, on account of its brightly colored fruit.

"The lower leaflets of the common form are distinctly oblique at the base, and not far from sessile. Those of the odd one are not at all oblique, are darker in hue, somewhat longer, and are longer stalked. The two kinds are much more unlike in general appearance than I can well describe. The odd one is much more profuse in flowers and fruit — but this may have no bearing. Its pods are borne in dense masses."

At the suggestion of Dr. St. John (who studied the fruiting material first submitted) the matter was held in abeyance until flowers could be secured for comparison. Mr. Brigham has now sent specimens of both the typical and aberrant forms and writes as follows concerning them: "I made an examination of the flowers a day or two ago and it seems to me the structure of those of both specimens is identical except that the odd one has smaller flowers; the ordinary form, growing within a few feet of the other, came into bloom about a week ahead of it. The flowers of the common form are entirely devoid of any maroon or purplish tint. It is curious that the maroon coloring so conspicuous in the mature fruit of the odd kind should appear so strongly in the flower-buds."

Study of these fruiting and flowering specimens has failed to disclose other differences than those so carefully noted by Mr. Brigham, and although these differences are essentially vegetative in character they may be taken as indicating a distinct species, since they are apparently very constant, as shown by the following quotation from Mr. Brigham.

"I have found three good-sized shrubs of the variety, in a location several miles from that in which the first one was obtained. They were growing among other shrubs of the typical form, from which I conclude that surrounding conditions of soil, moisture and exposure do not at all account for the variation.

"In addition to the plants mentioned above, I also located, late last fall, in a woodland some miles out, a solitary *Staphylea* which showed a still more marked divergence from the type in fruit and what remained of the leaves. I have ransacked many thickets and brooksides about Toledo to see if I could find a plant or plants which would show an intermediate stage between the two forms, but I have found none."

The petiolulate lateral leaflets, the shorter flowers and fruits and the more numerous seeds are the chief characters, then, of the new species which may very appropriately be known as

Staphylea Brighamii, spec. nov., *S. trifoliae* peraffinis; foliolis lateralibus petiolulatis basi non haud obliquis, laminis 6–8 cm. longis circa 3 cm. latis, petiolis 5–8 mm. longis; floribus brevioribus circa 6 mm. longis, sepalis purpureo-tinctis; capsula plus minusve purpureo-tincta solum circa 3 cm. longa et fere 3 cm. diametro; seminibus saepius 6–7.

Very similar to *S. trifolia* but lateral leaflets petiolulate and not at all oblique at base; blades 6–8 cm. long, about 3 cm. broad, petioles 5–8 mm. long: flowers shorter, about 6 mm. long, sepals purplish: capsule more or less tinted with purple only about 3 cm. long and nearly as thick; seeds often 6 or 7.— OHIO: near Toledo, Oct. 1, 1917, and May 6, 14, 1918, *H. C. Brigham* (TYPE, Gray Herb.).

GRAY HERBARIUM.

THE AMERICAN REPRESENTATIVES OF EQUISETUM SYLVATICUM.

M. L. FERNALD.

EUROPEAN descriptions of *Equisetum sylvaticum* and many American descriptions copied from them are nearly uniform in describing the branches as rough; thus, we find Schkuhr saying: "Rami verticillati, numerosi. . . .scabri,"[1] or Milde writing "Die Aeste. . . .rauh,"[2] while European figures very regularly show sections of the branches with conspicuous trichome-like spicules. These descriptions and illustrations have always been perplexing to certain American students who have been familiar with the plant of our woodlands and meadows, which is generally called *E. sylvaticum*, because in the American plant the branches are so universally glabrous or smooth. Examination of the material in the Gray Herbarium and the herbarium of the New England Botanical Club shows that there are 194 sheets of North American specimens and of these 194 sheets 188 have the branches

[1] Schkuhr, Krypt. Gewächse, 170 (1809).
[2] Milde, Gefäss.-Crypt. in Schles. 432 (1858).

quite smooth or with the merest suggestion of scabridity on the angles, while 4 have a more definite scabrousness on the young branches. Only 2 sheets, however, have the angles sufficiently scabrous to be comparable with the bulk of European specimens. One of these sheets, in which the branches are conspicuously scabrous, is the type of *E. sylvaticum*, var. *squarrosum* A. A. Eaton [1] from near Nome City, Alaska. The other material is from Parry Sound on Georgian Bay, Ontario. These two plants, from near Cape Nome and from Parry Sound, are inseparable from characteristic European specimens and must pass as essentially typical *E. sylvaticum*. Occasionally in Europe the branches are smooth as in the American plant, but the European material has so generally scabrous branches that few European authors, if any, have made note of smooth branches in the European plant. On the other hand, the tremendous preponderance of specimens with smooth branches in America (188 out of 194 sheets now before the writer) indicates that the smooth-branched tendency is the normal variation in North America, and as such it should be definitely designated as a geographic variety.

Just as the European plant differs in the degree of branching, the American is highly variable, but in general these variations in the degree of branching are of minor importance and for the most part not of sufficient constancy to merit special notice. It so happens, however, that the only name available for the smooth-branched American plant is one which was given by Milde to one of the less common variations, a northern tendency in which the branches are simple or subsimple or only very slightly forked. This, the plant found in Greenland, Labrador and much of the cooler region of Canada, was described very definitely by Milde as var. *pauciramosum* "Caulis erectus, inferne nudus, sublaevis, rami subsimplices. Labradoria (herb. Breutel). (Fig. 2.)" [2] The figure illustrating this variety shows it to be the characteristic plant of much of Labrador, Newfoundland and Quebec. This more slender form of the American plant, with the simple or subsimple smooth branches, and a very similar, though often larger, development of the same variation, occurs southward to Massachusetts, Connecticut and Ohio and very locally in the Selkirk Mountains of British Columbia.

A commoner American plant, however, has the branches very

[1] A. A. Eaton, Fern Bull. ix. 36 (1901).
[2] Milde, Mon. Equiset. 292, t. 9, fig. 2 (1865).

freely forking, much as in the European var. *pyramidale* Milde, but var. *pyramidale* has the scabrous angles of the branches characteristic of most European material, while the freely forking American plant is clearly only an extreme form of var. *pauciramosum*. Other variations in America of less pronounced character than those just discussed have been identified by the late A. A. Eaton with Milde's varieties and forms of the European plant, but so far as the writer can find from examination of Mr. Eaton's American material referred to var. *capillare* (Hoffm.) Willd., var. *robustum* Milde, var. *praecox* Milde, etc. these American plants are all phases of the smooth-branched North American var. *pauciramosum*. The form with freely forking branches, the only form of var. *pauciramosum* which seems to merit a special designation, is less common northward than the form with simpler branches, but in the southern part of the range it is distinctly more abundant, being the common plant of southern New England, southward into Pennsylvania and locally westward to British Columbia.

The three most pronounced American variations of *E. sylvaticum* may be briefly defined as follows:

E. SYLVATICUM L. Sp. Pl. ii. 1061 (1753). Branches copiously scabrous, especially along the lower internodes.— Common in Eurasia.[1] In North America apparently very local. The following specimens have been examined: ONTARIO: Parry Sound, Georgian Bay, August 21, 1901, *E. L. Moseley*. ALASKA: among alder and willow, 11 miles west of Nome City, August 5, 1900, *J. B. Flett*, no. 1524 (type of var. *squarrosum* A. A. Eaton, Fern Bull. ix. 36).

Var. PAUCIRAMOSUM Milde, Mon. Equiset. 292, t. 9, fig. 2 (1865).— Greenland and Labrador south to New England and locally westward to British Columbia; also eastern Asia and rarely in Europe. Material slightly transitional to the preceding has been seen from New Hampshire, Vermont, Massachusetts and Yukon.

Var. PAUCIRAMOSUM, forma **multiramosum**, n. f., ramis valde furcatis laevibus.— Southern Labrador and Newfoundland to Pennsylvania, locally westward to British Columbia. TYPE in Gray Herb. collected by *A. A. Heller* at Penryn, Lebanon County, Pennsylvania, May 30, 1889.

GRAY HERBARIUM.

[1] The writer can find no basis for the extreme restriction of the European range of this plant given by Mr. Eaton, who says "It grows from the highest north in Europe to about 71° N. Lat." — Fern Bull. ix. 34 (1901).

A Salix rostrata Hybrid?— At Franklin, Connecticut, there is a singular staminate willow, which the writer found May 14, 1917. It is a shrub 4 meters high, made up of five or six widely branching stems, springing from a common root, and all blooming profusely. Each flower has two filaments, which are united so as to appear as one, and hairy for their entire length. The two anthers bear copious pollen. The leaves seem to be good *Salix rostrata*. The other willows in the vicinity are *S. discolor*, *S. sericea* and *S. cordata*, species which, like normal *S. rostrata*, have two glabrous and distinct filaments. The union of two hairy filaments suggests affinity with *S. purpurea*, since our other willows with hairy filaments have the filaments free. In its other characters, the shrub does not betray the influence of any of our willows, with hairy filaments, and the modification of the inflorescence may not be the result of hybridization. One would hardly expect to meet with *S. purpurea* in a remote swamp of a Connecticut hill town. Specimens have been deposited in the Gray Herbarium.— R. W. Woodward, New Haven, Connecticut.

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A PLEA FOR AUREOLARIA.

Francis W. Pennell.

American botanists owe a debt of gratitude to Dr. S. F. Blake for his verification of many types of the species published by early workers in our field, results presented in the scholarly series of papers which has been appearing in Rhodora. In the current volume, page 66, is given the identity of *Rhinanthus virginicus* L. I am glad to accept the correction proposed, and, with Dr. Blake, wonder by what chance Pursh confused this species with his own "new" *Gerardia quercifolia*.

I cannot agree with Dr. Blake as to his application of the name *Gerardia flava* L. Linné gives citations — referring to Gronovius it is true — but after these he presents, as was his custom with species more carefully studied, a diagnosis. We know from B. D. Jackson's Index to the Linnean Herbarium that in 1753 Linné had in his herbarium a specimen, and from various determinations, acceded to by Dr. Blake, this is the glaucous species. The diagnosis favors this. The leaves are described as "basi incisapinnatim sinubus patulis," phrases usually too strong for the pubescent, but excellently describing the glaucous species. Moreover in the pubescent plant the flowers are very shortly and stiffly pediceled, so that the "spica" is scarcely to be characterized as "laxa."[1] To apply a Linnean name to a citation, in defiance of an extant specimen and a diagnosis apparently based upon this, is surely not warranted.

But it is to plead for the segregation of "Gerardia," or as I am pleased to note Dr. Blake agrees to term it *Agalinis*, that this paper is

[1] Or if *laxa* signifies a "spica" more broken, the advantage is still with the glaucous species.

written. Dr. Blake discusses my separation of *Aureolaria* and *Agalinis*, confining his remarks however to the provisional key given by me in considering only the species of the Atlantic Coastal Plain.[1] That he so confines his discussion cannot but leave some doubt as to the intimacy of his acquaintance with the plants of this group.

To those who seek to express species-relationship no fact becomes plainer than that each group must be viewed in the totality of its characters. To found a group upon a single character is unfortunate. Also to conclude, as has been reasoned, that because in one alliance a character is of little or great value, therefore it is valueless or of exceeding value in some other alliance, is logic often disproved. Characters, such as color, frequently of trifling worth, are in some groups of great racial importance. Moreover, while we would like to standardize Nature, by the conditions of Evolution we cannot make our genera truly co-ordinate. *Aureolaria* and *Agalinis*, separated, possibly have not the value, that is distinctness, of *Pedicularis*, but the facts I shall present I think show conclusively that they have far more distinctness than has any possible combination of these, together, or with other allies.

My key, referred to, distinguished these as follows:

"Corolla yellow. Anther-sacs parallel, awned at base. Capsule acute to acuminate. Seeds wingless or winged....................3. *Aureolaria*
"Corolla pink or purple. Anther-sacs more or less divergent, obtuse to mucronate-awned at base. Capsule rounded at apex. Seeds wingless. 4. *Agalinis*"

To these characters might be added:

Aureolaria.— Parasitic on roots of trees, each species restricted to one or few allied hosts, usually species of *Quercus*. Stems relatively stout. Leaves lanceolate to ovate, entire to bipinnatifid-lobed, relatively large.
Agalinis.— Parasitic on roots of herbaceous plants, rarely on shrubs or trees, each species on many diverse hosts (excepting in *A. linifolia* (Nutt.) Britton). Stems slender. Leaves linear-lanceolate to filiform or subulate, entire (except that toothing sometimes occurs in *A. heterophylla* (Nutt.) Small).

Of course these are vegetative characters, but they are characters in correlation with those of flowers and fruit. Let us consider these latter characters, those presented in the key above.

First, color of corolla.[2] *Aureolaria* possesses large corollas, in some

[1] Bull. Torr. Bot. Club **40**: 404. 1913.

[2] It may perhaps appear hazardous to discuss a character so perishable as color. But of the 48 species of *Aureolaria*, *Agalinis* and *Otophylla* of the United States I have collected and made descriptions of the fresh corollas of 43. The remaining 5 are closely akin to species seen.

species with irregularly distributed red-purple markings within. *Agalinis* possesses usually smaller thinner corollas, rose-pink to pink (not purple as previously stated), normally within on the anterior side marked with two longitudinal yellow lines to the antero-lateral sinuses, between which lines are almost always red-purple spots. The few cases where either lines or spots are lost seem evidently due to suppression. Possible exception must be made of the aberrant *A. linifolia*, in which, while spotting is present, the lines are absent. This species is too isolated for the student to risk the assumption that lining was ever present.

Second, anther-sacs. The anther-sacs of two of the three subgenera into which I would divide *Aureolaria* bear strongly developed horn-like awns. These are almost always somewhat curved. In spite of Dr. Blake's figure I can see little in common — except evolutionary origin — between these and the delicate semi-awning of *Agalinis*. In *Agalinis* there is every gradation between anthers rounded and anthers seemingly awned, but the latter state is ever an indeterminate attenuation and fusing, sometimes with slight hardening, of the lips of the orifice.[1] A far stronger case for his argument would be the condition found in my proposed third subgenus of *Aureolaria*, that which includes only the Mexican species, *A. Greggii* (S. Wats.).[2] In this the anther-sacs are quite awnless. But in other essential features this is an *Aureolaria*, nor does it seem surprising — and certainly no evidence of close kinship — that a primitive awnless state should be retained both here and in *Agalinis*. *A. Greggii* stands in some other features apart from typical *Aureolaria*, as does the equally aberrant *Agalinis linifolia* from others of that genus.

Third, capsule-shape. The distinction in this is constant, but the key-phrase for *Agalinis* should read "rounded with a mucro."

Fourth, seeds. In two subgenera of *Aureolaria* the seeds are

[1] Also the awning is always minute, I have seen no specimen showing this "precisely intermediate" with *Aureolaria*. *Agalinis* **peduncularis** (Benth.) Pennell, comb. nov. (*Gerardia peduncularis* Benth. in Hook. Comp. Bot. Mag. **1**: 209. 1835–6) seems a singularly unfortunate species to have been selected as intermediate, inasmuch as in this the anther-sacs vary from awnless to minutely awned, or as I would express it, from "acuminate to cuspidate." The awns of *Aureolaria* **grandiflora** (Benth.) Pennell, comb. nov. (*Gerardia grandiflora* Benth., l. c. 206), it is true, are short for that genus, but they are stout and slightly decurved, resembling minute horns.

[2] *Aureolaria* **Greggii** (S. Wats.) Pennell, comb. nov.— *Gerardia Greggii* S. Wats. in Proc. Amer. Acad. **18**: 131. 1883.

winged, but they are wingless in *Panctenis*, *A. pedicularia* (L.) Raf. and *A. pectinata* (Nutt.) Pennell. But for proving kinship such lack of winging is negative. Moreover the seeds of *Panctenis* and of *Agalinis* are readily distinguishable; in *Panctenis* they are plumper and the reticulations of the seed-coat are slightly raised giving a surface roughened, minutely honeycombed; in *Agalinis* the thinner usually more angular seeds are practically smooth.

Such is the correlation, not absolute, of characters by which to distinguish *Aureolaria* and *Agalinis*. Less may be urged for *Otophylla*. But certain features appear. Most important, I believe, is the reduction of the anthers of the posterior pair of stamens. Correlated with this we find: stem retrorse-hispid (not ascending-scabrous to glabrous as in *Agalinis*); leaves broader, lanceolate to ovate, in one species usually incised at base, in the other bipinnatifid; pedicels shorter, so that flowers are nearly sessile; corolla (as in *Agalinis linifolia*) with no trace of yellow lines within; and seeds honeycombed.

Now let us hold these three natural groups in one genus and attempt to find characters by which to distinguish the whole from allied genera. Allies are found in South America, and especially in Africa and Asia.

(A) The open-throated corolla is satisfactory for our flora but cannot be used as against *Sopubia*, *Graderia*, etc. Moreover it is not constant within "Gerardia," for in one section of *Agalinis* the corolla is progressively modified through stages present in various species [1] into the flattened "two-lipped" corollas of *A. divaricata* (Chapm.) Pennell and *A. filicaulis* (Benth.) Pennell.

(B) Equivalence of anther-sacs. In most of the allied genera we find a reduction of one sac of each anther.[2] But in certain of the Old World genera, and such New World allies as *Afzelia* (*Seymeria*) and *Silvia* this does not occur. Moreover absence of reduction is again purely a negative character. *Otophylla* is reducing its anthers by another process, also worthy of recognition.

(C) Absence of bractlets on pedicel. Again a negative character; of value in distinguishing from many Old World, but not from New World allies.

(D) There is but one other point occurring to me, the only feature

[1] *E. g.* our common *A. tenuifolia* (Vahl) Raf.

[2] There is an American species, wrongly heretofore held in "Gerardia," which shows this well, *Gerardia hispidula* Mart. This possesses other points of distinction, including bluish corollas and bractlets on pedicel.

which is positive, the fact that the two plate-like lobes of the stigma have fused, leaving as stigmatic areas only the lines of fusion on either side. But this condition is true, and also stages of evolution toward it are shown, in others of this tribe. There is a southwestern species which we have long been assured is a "Gerardia," *G. Wrightii* A. Gray, in which the stigma is capitate. Having correlated characters, I consider the last a monotypic genus. To be required to retain it in an aggregate *Agalinis* would certainly make all definition that defines hopeless.

If we accept as distinct genera *Aureolaria* and *Agalinis* we have for each excellent correlations of mostly positive characters; of habit, leaf, corolla-color, anther-awning (with one exception), capsule-shape and (of two types in *Aureolaria*) of seed. Moreover with one exception, the specific range of parasitism is quite different. If we unite these, or place others with them, and then seek to limit our aggregate genus, we find our problem difficult and any result unsatisfactory. Of course genera can be built upon single characters, but the purpose of genera is the expression of kinship, not the arbitrary division of the field of nature into categories of classification.

Pardon so long a discussion. But I feel that misunderstanding frequently exists, because we can not or do not make our comparisons sufficiently broad. Frequently the cry is raised, and too often with justification, against the splitting of old genera into segregates — these apparently distinct for the area under consideration but well-merged by intermediate species elsewhere. More rarely, or at least less protested, is the opposite case, the joining of natural groups into aggregates which beyond the home-area are ill-defined or not definable. I hope that this paper has presented clearly enough one such case, and that for the future we can all agree in the use of the names *Aureolaria* and *Otophylla.*

New York Botanical Garden.

SOME ALLIES OF RYNCHOSPORA MACROSTACHYA.

M. L. Fernald.

The only Rynchosporas of the large-fruited series which are found from New Jersey to Massachusetts are referred to *R. macrostachya* Torr. and *R. macrostachya*, var. *inundata* (Oakes) Fernald, although Dr. Britton, who does not recognize the specific distinctness of *R. macrostachya*, refers both these plants to *R. corniculata* (Lam.) Gray. A recent examination of the New England material, however, has brought to light certain heretofore overlooked characters, which indicate conclusively that *R. macrostachya* is specifically distinct from *R. corniculata*, and, at the same time, that the little plant described by William Oakes from West Pond, Plymouth, Massachusetts, as *Ceratoschoenus macrostachys*, *β. inundatus* [1] is specifically distinct from both. This latter discovery is particularly gratifying in view of Oakes's observation when he originally described the plant, that "This variety appears at first sight like a distinct species." Oakes, it would seem, was deceived by the assumption that the occurrence of his variety from West Pond "in deeper water than the common one" was "the cause of its different appearance."

R. macrostachya is a non-stoloniferous plant, the new autumnal shoots being erect and arising from within the old sheaths and growing close to the old culms. The plant described by Oakes as var. *inundata* is a comparatively rare plant, found, so far as known, at a single pond in Plymouth County, Massachusetts, in one or perhaps two ponds on Long Island, and at only a few stations in New Jersey, and all the material shows it to be loosely stoloniferous, the new horizontal leafless offshoots being a decimeter or more in length. The plant is very much smaller in all its parts than *R. macrostachya*, growing much lower, only 2–6 dm. high, and having much more slender leaves and shorter spikelets. The striking difference in the habit of the plant has already been emphasized by Oakes and again by the present writer,[2] *R. macrostachya* having the branches of the large inflorescences strongly fastigiate, the primary glomerules with 10–50 spikelets. Var. *inundata*, on the other hand, has the inflorescence diffuse, the primary glomerules with few spikelets (1–6). But the most pronounced differences are found in the mature fruits. In *R. macrostachya* the mature achene is

[1] Oakes in Hovey's Mag. vii. 185 (1841).

[2] Fernald, Rhodora, xviii. 164 (196).

5–6 mm. long, 2.6–3 mm. broad; the tubercle 1.9–2.2 cm. long; and the 6 bristles mostly 1.1–1.4 mm. long. In Oakes's variety the mature achenes are 4.2–4.8 mm. long, 2.2–2.6 mm. broad; the tubercle 1.5–1.7 cm. long; and the bristles 0.9–1.1 cm. long. It thus seems that the plant which is passing as *R. macrostachya,* var. *inundata* is clearly distinct from *R. macrostachya* and should be called

Rynchospora **inundata** (Oakes), n. comb. *Ceratoschoenus macrostachys, β. inundatus* Oakes in Hovey's Mag. vii. 185 (1841). *R. macrostachya,* var. *inundata* Fernald, Rhodora, viii. 164 (1906).

When the present writer transferred Oakes's variety to *Rynchospora* he identified with it Chapman's Florida plant, which was originally described as *Ceratoschoenus macrostachyus,* var. *patulus* in 1860.[1] This variety of Chapman's is considered by Britton a variety of *R. corniculata,* with which Britton unites *R. macrostachya,* but it has characters which separate it very definitely from all three species. Like *R. inundata,* this Florida plant is loosely stonoliferous and has the diffuse inflorescences, which characters separate it at once from *R. macrostachya;* and its achene is much shorter than in the non-stoloniferous *R. macrostachya* but very much broader than in the stoloniferous *R. inundata,* while its tubercles and bristles are shorter than in either of those species. From *R. corniculata,* which the plant resembles, it is separated at once by its shorter achene, shorter tubercle and much longer bristles. This plant, of which there is a large amount of material in the Gray Herbarium, collected by Chapman and others in Florida, and some specimens from north to South Carolina, has the achenes 4.2–4.6 mm. long, 3–3.5 mm. broad, the tubercle 1–1.4 cm. long, and the usually 4 bristles 4.4–8 mm. long; typical *R. corniculata,* which abounds from Florida westward to Louisiana and extends northward to Delaware and Missouri, having the achenes 5–6 mm. long, 2.8–3.3 mm. broad, the tubercle 1.5–1.8 mm. long, and the 5–7 very short bristles at most 3–4 mm. in length. Chapman's plant seems, therefore, to be a definite species, but, in view of the fact that there are already species bearing the names *R. patula* and *R. Chapmanii,* another name is necessary for it. It is, therefore, a pleasure to commemorate in the name of this species the discrimination of that prince of students of the *Cyperaceae,* John Carey, who marked upon one of the Chapman sheets in the Gray Herbarium "These specimens incline me to think that this is indeed a good species." This species is then

[1] Chapman, Fl. 529 (1860).

Rynchospora **Careyana**, n. nom. *Ceratoschoenus macrostachyus*, var. *patulus* Chapman, Fl. 529 (1860). *R. corniculata*, var. *patula* Britton, Trans. N. Y. Sci. xi. 84 (1892). *R. macrostachya*, var. *patula* Chapman, Fl. ed. 3, 556 (1897).

Typical *R. corniculata* (Lam.) Gray has the achenes round-obovate and twice as broad as the base of the tubercle, the achenes measuring 5–6 mm. long, 2.8–3.3 mm. broad. This plant, as already stated, extends from Florida northward to Delaware and westward to Louisiana, thence north to Missouri. The commoner plant westward, in Texas and Arkansas, locally northward to Indiana and occasionally eastward to Alabama, has a more slender achene which at the summit is scarcely broader than the base of the tubercle, so that the two seem nearly confluent. In this plant the somewhat duller achenes measure 4.5–5.3 mm. long, 2.4–2.6 mm. broad, but its perianth-bristles and aspect are quite like those of typical *R. corniculata*. Differing only in the much narrower and somewhat shorter achene and conspicuously overlapping the range of *R. corniculata*, the plant is probably best treated as a geographic variety, which is here proposed as

Rynchospora corniculata (Lam.) Gray, var. **interior**, n. var., achaeniis fuscis 4.5–5.3 mm. longis 2.4–2.6 mm. latis cum tuberculis subconfluentibus.— Alabama to Texas, Arkansas, and Indiana. Type: swamps, southern Arkansas, *F. L. Harvey*, no. 24 (Gray Herb.).

Briefly summarized the distinctions between the species above discussed may be stated as follows:

Bristles mostly exceeding the achene; the longest 4.4–14 mm. long.
- Plant non-stoloniferous: inflorescence fastigiate; the primary glomerules with 10–50 spikelets; achene 5–6 mm. long: tubercle 1.9–2.2 cm. long: bristles 6, 1.1–1.4 cm. long.......... *R. macrostachya* Torr.
- Plant loosely stoloniferous: inflorescence diffuse; the primary glomerules with few spikelets: achene 4.2–4.8 mm. long: tubercle 1–1.8 cm. long: bristles 4–6, the longer 4.4–11 mm. long.
  - Achene 2.2–2.6 mm. broad; tubercle 1.5–1.7 cm. long: bristles 6 (rarely 5), the longest 9–11 mm. long. . *R. inundata* (Oakes) Fernald.
  - Achene 3–3.5 mm. broad; tubercle 1–1.4 cm. long: bristles 4 (rarely 5 or 6), the longest 4.4–8 mm. long........ *R. Careyana* Fernald.

Bristles much shorter than the achene, all but 1–3 very short or nearly obsolete; the longest 2.5–4 mm. long: plant apparently not stoloniferous.[1]
- Achene 5–6 mm. long, 2.8–3.3 mm. broad, twice as broad as the base of the tubercle.......................... *R. corniculata* (Lam.) Gray.
- Achene 4.4–5.3 mm. long, 2.4–2.6 mm. broad, the summit scarcely broader than the base of the tubercle..... *R. corniculata*, var. *interior* Fernald.

Gray Herbarium.

[1] The herbarium material shows only fragmentary bases but these lack the loosely divergent stolons so characteristic of *R. inundata* and of *R. Careyana*. Further observations and better collections may show definite stolons in *R. corniculata*.

NOTES FROM THE WOODS HOLE LABORATORY — 1917.

Edited by F. S. Collins.

(Plate 124.)

I. Species new to Science or to the Region.

The summer of 1917 proved quite fruitful in novelties at Woods Hole, and from the data and material submitted to me by Dr. I. F. Lewis, of the botanical staff of the Laboratory, I have made up the following notes. The fresh water material is from Wood Pond at Woods Hole, and from Tarpaulin Pond, near Tarpaulin Cove, Naushon, Elizabeth Islands. Miss Jane M. Furber has made a special study of the flora of the latter pond, both as to species found there, and as to seasonal variations; the results of her study will be published later, and I here include from this station only species new to science or to this region. A new species of *Erythrotrichia*, from Woods Hole, collected by F. G. Gustafson, is described on the following pages by Ralph E. Cleland. A new genus of Conjugatae is of importance enough to justify a special paper, which will soon be published by Dr. Lewis, who detected it in material from Wood Pond.

Chroococcus limneticus Lemmermann, Beiträge zur Kentniss der Planktonalgen, II. Bot. Centralblatt, Vol. LXXVI, p. 153, 1898. This is common in both Wood and Tarpaulin Ponds, among other algae. The cells are 8–13 μ diam., aeruginous; the tendency to division is considerably less in one direction than in the other two, and as the cells remain much in the position assumed on dividing, the result is a Merismopedium-like frond in surface view; the cells are similarly placed, quadrately, but the outline of the frond is irregular, not square as in *Merismopedium;* moreover any large colony is at least two cells thick. It was reported from Lake Erie by Miss Julia W. Snow, The Plankton Algae of Lake Erie, Bull. U. S. Fish Com., p. 392, 1908, but has not been recorded in this part of the country.

Microchaete **naushonensis** n. sp. Filamentis non attenuatis nec incrassatis, rectis vel subflexuosis, interdum erectis, vulgo prostratis; trichomate 6–7 μ diam., purpureo, longitudine cellularum diametrum aequante, paullo plus vel minus; cellulis inferioribus cylindricis, indistinctis; superioribus subrotundatis, moniliformibus; vagina

tenui, membranacea, aequali, hyalina; heterocysta basali globosa, vel superne subapplanata, 5–6 μ diam., interdum solitaria, vulgo sub heterocysta cylindrica, apicibus rotundatis, 7–8 × 10–17 μ, haud raro duo, raro tres seriatis super heterocystam basalem; heterocystis intercalaribus? sporis?

Filaments neither thickened nor attenuate, straight or subflexuous, sometimes erect, usually prostrate; trichome 6–7 μ diam., cells as long as broad or slightly more or less; lower cells cylindrical, indistinct; upper cells rounded, moniliform; sheath thin, membranaceous, even, hyaline; basal heterocyst globose, or somewhat flattened above, 5–6 μ diam., sometimes solitary, commonly below a cylindrical heterocyst with rounded ends, 7–8 × 10–17 μ, frequently two, rarely three such heterocysts in a series above the basal heterocyst. Intercalary heterocysts and spores not observed. On leaves of *Sphagnum* and other water plants, occasionally on *Oedogonium*, Tarpaulin Pond, August, 1917, *Miss J. M. Furber*. Type in Collins herbarium.

On the *Sphagnum* leaves the prostrate filaments usually run lengthwise, either up or down; often two basal heterocysts will be in close contact, the filaments of both forming a straight line, giving the effect of one filament with two intercalary heterocysts. On *Oedogonium Borisianum* the filaments wind spirally about the host filament. *Hapalosiphon pumilus* and *H. hibernicus* occur with it, but lack the purplish shade of the *Microchaete*, and of course are amply distinct in branching.

Bulbochaete **Furberae** n. sp. Dioecia, nannandria, gynandrospora; oogoniis depresso-globosis, sub seta terminali, patentibus (interdum adparenter erectis); dissepimento infimo; oosporae episporio scrobiculato; androsporangiis sparsis, 1–9-cellularibus, nannandriis ad oogonium, antheridio interiori, stipite valde curvato, antheridio breviore.

Dioecious, nannandrous, gynandrosporous, oogonium depressed-globose, below terminal seta, patent (sometimes apparently erect); dissepiment very low; epispore of oospore scrobiculate; androsporangia scattered, 1–9-celled nannandria on oogonium; antheridium interior, stipe strongly curved, shorter than the antheridium.

Wood Pond, Woods Hole, Massachusetts, Aug., 1917. *Miss J. M. Furber & I. F. Lewis*. Type in Collins herbarium.

Veg. cell,	10–15 μ diam.,	3–5 diam. long.
Oog.	36–43 μ diam.,	27–34 μ long.
Andr. cell,	9–10 μ diam.,	8–9 μ long.
Nann.	7–8 μ diam.,	20–25 μ long.

The oogonium is occasionally on one of the lower cells of a branch, but more commonly on the upper cell; usually this cell bears a seta

and the oogonium is patent, but not infrequently the seta does not develop, and in that case the oogonium is regularly erect. The nearest relative seems to be *B. Brebissonii*, but that species has larger dimensions, fewer-celled androsporangia, and less curved dwarf males.

B. ELATIOR Pringsheim, not before recorded for America, also occurs in the Wood Pond material, and is of much the same dimensions as *B. Furberae*, but has oogonia more angular and with smooth epispore, and androsporangia epigynous. *B. intermedia* var. *supramediana* Hirn, already known in Massachusetts, also occurs, but it is a plant of larger dimensions than *B. Furberae*, with relatively shorter cells and higher dissepiments.

MIKROSYPHAR PORPHYRAE Kuckuck, Bermerkungen zur marinen Algenvegetation von Helgoland, II, p. 381. This forms minute brown dots in the fronds of *Porphyra umbilicalis* (L.) J. Ag., ultimately destroying the infested portion of the latter, leaving a perforation in place of the *Microsyphar* colony. The filaments wind between the large cells of the host, branching more or less freely, with no erect filaments and no hairs. The fructification is of the simplest type, a single zoospore forming in the terminal cell of a branch, or a few zoospores forming each in a small cell partitioned off in such a terminal cell, constituting a very rudimentary plurilocular sporangium. It is fairly common, with various other epiphytes and parasites, at one or two stations at Woods Hole, and has not before been reported in this country.

NOSTOC PUNCTIFORME Hariot ex Bornet & Flahault, Revision des Nost. Het., part IV, p. 189, 1888, was found throughout the summer at Tarpaulin Pond. It is so closely associated with *Sphagnum* sp. that it may be called symbiotic. Sometimes it is found on the surface of the leaves, but more usually it occurs inside the dead and otherwise empty cells so characteristic of *Sphagnum*. It is also found in the cells of the stem. The *Sphagnum* does not react visibly to the presence of the *Nostoc*. *N. punctiforme* has been recorded, Forti, Syll. Myx., p. 388, as widely distributed in Europe, South America and the oceanic islands of the tropics as an epiphyte and endophyte on *Lemna*, in *Gunnera* and several lichens, and also on moist earth. From the United States it has been reported, Tilden, Minnesota Algae, p. 164, only as an endophyte in the roots of cycads, where it is associated with nodule formation and with a peculiar mode of growth of the roots.— F. S. COLLINS, North Eastham, Massachusetts.

II. A new Erythrotrichia from Woods Hole.

Erythrotrichia rhizoidea, n. sp. Thallus filamentoso-teres, roseus v. roseo-purpureus, rectus, 1–4 mm. longus, 10–50 μ diametro. Basis rhizoidalis, ex qua breves recti thalli secundarii nascuntur. Sporae roseae, 8–10 μ diametro.

Thallus dark red to reddish-purple, upright, terete, 4 mm. long at most, usually 1–2 mm. in length; 10 μ in diameter at base, increasing to 40–50 μ above; dividing at base into several short, irregularly down-growing rhizoidal filaments, which penetrate into the tissue of the host, and from which arise often one or more secondary thalli, rarely approaching the primary thallus in length, usually much shorter. Cells roundish-polygonal, 10–20 μ in diameter, dividing above in both horizontal planes into 4–8 cells. Spores reddish, 8–10 μ in diameter. Sexual organs not observed. Growing on *Porphyra umbilicalis* in the harbor of Woods Hole, Mass. Abundant. August, 1917.

This species differs from *E. Bertholdii* Batt. (= *E. ciliaris* Berth., but not *Bangia ciliaris* Carm., according to Batters) [1] in its smaller size, the presence of secondary upright thalli, and the rhizoidal nature of the holdfast. *E. Bertholdii* Batt. is attached merely by its slightly expanded basal cell.

It differs from *E. discigera* Berth.,[2] in that it has no definite basal disc as holdfast, and the holdfast is never seen without filaments attached.

Differs from *E. ciliaris* Batt.,[1] the species that Batters considers to be the original *Bangia ciliaris* of Carmichael, in the absence of a basal disc. In *E. ciliaris*, also, the erect filaments all appear to be of about the same strength and length. In our species, however, only one filament attains to any length, the others, when there are others, being usually very short.

E. obscura Berth.[2] does not fit our species in the following respects:— 1. Its blackish color. 2. When there are more than one series of cells, they lie in one plane. 3. The erect frond may have branches at the base, but no rhizoids. 4. The holdfast is in the nature of a basal disc. 5. In summer, the basal discs are very usually found bearing no erect filaments.

[1] Batters, E. A. L. New or Critical British Marine Algae. Journal of Botany, Vol. 38, pp. 369–379.

[2] Berthold, G. Die Bangiaceen des Golfes von Neapel. Fauna u. Flora des Golfes von Neapel, Vol. VIII, Leipzig, 1882.

We seem here to be dealing with a new species. Its main points of difference from previously described species lie in the rhizoidal nature of the holdfast; the marked differentiation of erect filaments into one primary and several secondary ones; the fact that the secondary filaments develop, not from the main thallus, but from the rhizoids; and the fact that holdfasts have not been seen without erect fronds. The reason for this latter fact appears to lie in the nature of the development from the spore. The spore, upon germination, gives rise to an upright filament which later becomes the primary thallus. When this is only a few cells in length, the lowest cell appears to swell and puts forth two or three filaments downward into the host tissue. The holdfast develops later therefore than the primary thallus. Any secondary filaments that may appear arise as buds from these rhizoid-like structures.

No sexual reproduction has been observed in this plant, but spores are produced in the manner characteristic of the genus.— Ralph E. Cleland, University of Pennsylvania.

Explanation of Plate 124.

Fig. 1. Bulbochaete Furberae; erect oogonium. × 485.
Fig. 2. " " patent oogonium. × 485.
Fig. 3. " " immature oogonium with two dwarf males. × 485.
Fig. 4. " " oogonium slightly more developed, with five dwarf males. × 485.
Fig. 5. " " androsporangium. × 485.
Fig. 6. Erythrotrichia rhizoidea; holdfast. × 455.
Fig. 7. " " secondary thallus arising at base of primary thallus. × 485.
Fig. 8. " " formation of spore. × 455.
Fig. 9. " " escaping spore. × 455.

Figs. 1–5 are by I. F. Lewis; 6–9 by R. E. Cleland.

THE SPECIFIC IDENTITY OF BIDENS HYPERBOREA AND B. COLPOPHILA.

M. L. Fernald.

In 1885 Mr. J. M. Macoun collected at Rupert House, James Bay, a little *Bidens* which was subsequently described as *B. hyperborea* Greene.[1] This collection consisted of three small plants each with one head and with the foliage badly mangled. Somewhat later the present writer,[2] in attempting to identify a characteristic plant of the tidal reaches of the rivers of the Gaspé Peninsula, finally decided that the Gaspé plant was best placed with *B. hyperborea,* the achenes of the two being exactly alike in their technical characters, that is, they were flat linear-cuneiform strongly striate achenes, without the suberous margins and prominent ribs which are so characteristic of *B. cernua.* Still later, in 1909, material collected in southern Maine, along Winnegance Creek, was referred by Fernald & Wiegand[3] on account of its achene-characters to *B. hyperborea.* Subsequently, in studying this material and some other specimens from adjacent waters of the lower Kennebec and Androscoggin systems in Maine, characters were found which seemed to set this Maine plant off very definitely from the little Gaspé plant which had formerly been identified with *B. hyperborea,* and the Maine plant was consequently described as *B. colpophila* Fernald & St. John.[4] During the summer of 1916 Mr. Bayard Long and the writer collected plants of this affinity extensively in Maine, where they abound on the tidal reaches of the Penobscot and Kennebec systems, and other material heretofore unidentified shows the plant of the lower Penobscot and Kennebec to occur also on the brackish marshes of the Merrimac in Essex County, Massachusetts.

The writer's attention has been redirected to this group of plants by Dr. Earl E. Sherff, who has very kindly called attention to the fact that the Gaspé plant, which had been originally identified with *B. hyperborea,* is very unlike the original James Bay material in some

[1] Greene, Pittonia, iv. 257 (1901).
[2] Fernald, Rhodora, x. 201–203 (1908).
[3] Fernald & Wiegand, Rhodora, xii. 120, 144 (1910).
[4] Fernald & St. John, Rhodora, xvii. 21 (1915).

regards, but that the Maine coast *B. colpophila* is certainly conspecific with *B. hyperborea.* With these decisions of Dr. Sherff the writer is entirely in accord but a detailed study of all the material has convinced him that, although the Gaspé plant differs in certain habital traits, it, with all the other variations, from James Bay, the Maine coast and the lower Merrimac, makes up a single species with certain very clearly marked characters. The superficial trait which separates this complex species of the estuaries and saline marshes, *B. hyperborea,* from the *B. cernua,* with which it is most apt to be confused, is the erect heads which commonly remain quite erect in fruiting,[1] *B. cernua* when well developed having the fruiting heads abruptly nodding. In *B. hyperborea* and its varieties the outer involucre consists of strongly ascending or only slightly spreading bracts; the outer involucre of *B. cernua* being reflexed or strongly divergent, not ascending. The disk-corollas of *B. hyperborea* are 4-toothed, of *B. cernua* commonly 5-toothed. In *B. hyperborea* the anthers are included, becoming exserted only by the shriveling of the corolla; in *B. cernua* the anthers are commonly exserted and conspicuous in the fresh flowering material. But the greatest difference between the two species is in the achenes. In *B. cernua* the fully matured achene is curved and with almost wing-like coarsely retrorse-barbed pale margins and keels and its surfaces between the keels and margins ordinarily smooth or only obscurely furrowed; the outer achenes are 3.3–6.3 mm. long and 2–2.8 mm. wide; and the central achenes 4.2–7.8 mm. long and 1.8–2.5 mm. wide. In *B. hyperborea,* on the other hand, the achenes are straight, flat or flattish and not wing-margined nor with prominent keels, only slightly thickened at the summit and with 7–15 prominent ribs on each face; and the outer are 4.2–8.4 mm. long, the inner 6–10 mm. long, 1.4–1.9 mm. broad, i. e. the achene is flat and more slender than in *B. cernua.*

That *B. hyperborea* (including *B. colpophila*) is thoroughly distinct from *B. cernua* there can be no question, but the species is itself highly variable, the varieties apparently being very definitely isolated. The typical plant from James Bay is not exactly matched by any material the writer has seen, although it is very close to some of the Maine

[1] Some dried material collected by the present writer shows arching of the peduncles which gives in the herbarium the impression that the heads are sometimes nodding; but in these cases the arching was due to leaving the specimens over night in the collecting boxes, and their consequent bending toward the light entering the boxes in the early morning. All material in the field, where the present writer is very familiar with the plant, shows quite definitely ascending fruiting heads.

material. In its absolutely simple monocephalous habit it is extreme, the simplest plants from Maine being usually somewhat branched. The leaves of the James Bay plant are badly crumpled but so far as the writer is able to make out by reconstruction they are blunt or obtuse and with very obscure toothing, the largest leaves measuring about 4 cm. long. The outer bracts of the involucre are 1.5–1.7 cm. long, only slightly exceeding the disk; and the achenes of the Macoun material, some of which have been kindly loaned by Dr. Sherff, measure barely 6 mm. in length, with the marginal awns about 3 mm. long. In these measurements the achenes are like the commoner plant of the Penobscot, Kennebec and Merrimac systems, but much smaller than in the plant of Gaspé rivers or in a very extreme plant which occupies the tidal flats of Cathance River in Maine. But the commoner Maine plant, *B. colpophila,* is much larger in its development than the James Bay specimens, all material definitely branching with the exception of obviously depauperate individuals in which, however, incipient branches are evident. The Maine plant, *B. colpophila,* ordinarily has longer leaves which are mostly long-attenuate at tip and more definitely toothed than in typical *B. hyperborea;* and the outer involucre in *B. colpophila* is decidedly longer, the bracts usually exceeding the disk.

A plant which abounds on the tidal flats of Cathance River and which has been distributed as *B. colpophila* stands apart from both typical *B. hyperborea* and true *B. colpophila* by its much longer achenes. This plant, of which several numbers representing minor variations have been collected, has the outer achenes 7.5–8.5 mm. long, the inner 8.7–10 mm. long with the marginal awns 3.5–5 mm. long, and on account of its extreme abundance along Cathance River and the uniformity of the material collected in large quantity at different spots is considered a pronounced geographic variant. The Gaspé plant which was originally taken for *B. hyperborea* departs from that species in certain conspicuous traits, although its very small subentire leaves are essentially identical with those of the James Bay plant. The Gaspé material shows a very strong tendency to produce numerous arcuate branches; its outer involucre consists of very frondose bracts, 2–6 cm. long, and its achenes are as long as in the Cathance River variant, the outer 6–8 mm. long, the inner 7.5–10 mm. long with marginal awns 3–3.5 mm. long.

To summarize, *B. hyperborea,* as now understood, is an estuary

species of very disrupted range and, presumably on account of the extreme isolation of its habitats, it presents several pronounced geographic variants. These may be defined as follows:

Outer achenes 4.2–5 mm. long; the inner 6–7 mm. long, with marginal awns 1.8–3 mm. long.

Plant simple and monocephalous: leaves oblanceolate and blunt, subentire or obscurely toothed; the longer 4 cm. long: bracts of the outer involucre 1.5–1.7 cm. long, only slightly exceeding the disk. *B. hyperborea* (typical).

Stem branching; the branches strongly ascending, few to very numerous: leaves linear to oblanceolate, attenuate, commonly with 3–10 pairs of sharp teeth; the primary leaves 0.5–1.2 dm. long: bracts of the outer involucre 1.5–4 cm. long..........var. *colpophila*.

Outer achenes 6–8.5 mm. long; the inner 7.5–10 mm. long, with marginal awns 3–5 mm. long.

Tall, 3–7 dm. high, with strongly ascending branches: leaves thin, with midrib prominent beneath, long-attenuate at tip; the primary ones 0.6–1.4 dm. long, with numerous sharp teeth: bracts of outer involucre 4–9, linear to lanceolate, acute or acuminate, entire, 1.5–3.5 cm. long..................................var. *cathancensis*.

Low, usually depressed and matted, 0.5–2.5 dm. high, the branches usually arcuate: leaves fleshy, obtuse, with midrib obscure; the primary ones 1.5–6.5 cm. long, entire or with 1 or 2 pairs of coarse teeth: bracts of outer involucre 2–4, oblanceolate, obtusish, entire or toothed, 2–6 cm. long..........................var. *gaspensis*.

B. HYPERBOREA Greene, Pittonia iv. 257 (1901).— The typical form of the species is known only from the original collection from Rupert House, James Bay, September 5, 1885, *J. M. Macoun*, no. 12056.

Var. **colpophila** (Fernald & St. John), n. comb. *B. colpophila* Fernald & St. John, RHODORA, xvii. 21 (1915).— Tidal flats and borders of salt marshes, Maine and Massachusetts. The following specimens may be cited: MAINE: abundant on tidal mud-flats of the Penobscot River, Bangor, September 7, 1916, *Fernald & Long*, nos. 14829, 14830; very abundant on tidal mud-flats at the mouth of Reed Brook, Hampden, September 8, 1916, *Fernald & Long*, nos. 14831, 14832, also in *Pl. Exsicc. Gray.* no. 296; tidal mud-flats at mouth of Souadabscook Stream, Hampden, September 11, 1916, *Fernald & Long*, nos. 14833, 14834; borders of salt marsh, Back River Creek, Woolwich, September 15, 1916, *Fernald & Long*, no. 14826; above tide-limit at edge of marsh and among sedges and rushes of salt marsh, Winnegance Creek, Phippsburg, August 23, 1909, *Fernald*, nos. 2248, 2249; Cow Island, Topsham, August, 1910, *Kate Furbish;* bank of Androscoggin River, Brunswick, August 13, 1911, *C. H. Bissell;* August 22, 1911, *R. A. Ware*, no. 4230. MASSACHUSETTS: brackish muddy shore of the Merrimac, Newburyport, October 2, 1902, *A. A. Eaton & M. L. Fernald.*

Var. **cathancensis,** n. var., planta erecta 3–7 dm. alta ramibus valde adscendentibus; foliis tenuibus lineari-oblanceolatis attenuato-acuminatis argute serratis, primariis 0.6–1.4 dm. longis, costa subtus promi-

nente; bracteis involucri exterioribus 4–9 linearibus vel lanceolatis acutis 1.5–3.5 cm. longis; achaeniis exterioribus 7.5–8.5 mm. longis, interioribus 8.7–10 mm. longis aristis marginalibus 3.5–5 mm. longis.

Plant erect, 3–7 dm. high, with strongly ascending branches: leaves thin, linear-oblanceolate, attenuate-acuminate, coarsely serrate; the primary 0.6–1.4 dm. long, with the midrib prominent beneath: bracts of the outer involucre 4–9, linear or lanceolate, acute, 1.5–3.5 cm. long: outer achenes 7.5–8.5 mm. long; the inner 8.7–10 mm. long, with marginal awns 3.5–5 mm. long.— Maine: tidal mud-flats of Cathance River, Bowdoinham, September 14 and 19, 1916, *Fernald & Long*, nos. 14825, 14927 (type in Gray Herb.), 14828, also in *Pl. Exsicc. Gray.* no. 295.

Var. **gaspensis**, n. var. *B. hyperborea* Fernald, Rhodora, x. 202 (1908) excluding plant of James Bay.— Estuaries of the rivers of the Gaspé Peninsula, Quebec. The following specimens may be cited: submerged at high tide, brackish shores about the mouth of Dartmouth River, August 26 & 27, 1904, *Collins, Fernald & Pease* (type in Gray Herb.); brackish shore, submerged at high tide, mouth of St. John River, Douglastown, August 23, 1904, *Fernald, Collins & Pease;* brackish shore, submerged at high tide, alluvial islands at the mouth of Bonaventure River, August 4, 1904, *Collins, Fernald & Pease;* material has also been seen from the mouth of York River, Gaspé and from the mouth of Matane River, Matane County (coll. *F. F. Forbes*).

Gray Herbarium.

A NEW PEREZIA ADVENTIVE IN MASSACHUSETTS.

J. Francis Macbride.

During last summer a strange daisy-like plant appeared in the vegetable garden of Mrs. Frank E. Lowe of North Worcester, Massachusetts. Because of its attractiveness it was allowed to grow and a specimen was sent to the Gray Herbarium for determination. Now study has disclosed the rather surprising fact that it is a species of *Perezia* seemingly undescribed and not closely related to any of the species in the section of the genus to which it belongs, a section which is represented only in South America. This group of species is at once distinguishable from the true Perezias of Mexico and Central America by the pauciseriate involucre and at one time was treated as a separate genus under the name *Homoeanthus*. The species are widely distributed, particularly over the sheep-grazing areas of the

southern continent, and in all probability the plant that occurred in Mrs. Lowe's garden, since the land was fertilized with wool-waste, grew from a seed that came in wool. The company from which the wool-waste was secured have informed Mrs. Lowe that a portion at least of the wool they use is South American. Remarkable as is this occurrence in New England of a new species native to South America the situation comes quite within the range of possibilities when one recalls that botanical exploration in the southern continent has been restricted to comparatively small areas and that there many species remain to be recognized. It may be mentioned that a number of species of *Perezia* have been proposed as new within recent years.

Since the genus *Perezia* belongs to the tribe *Mutisieae*, sometimes treated as the series *Labiataeflorae*, a group of the *Compositae* not known to many New England botanists, a few words in regard to the character of these plants may not seem out of place. This tribe (or series) stands next to the *Liguliflorae* from which it may be distinguished readily by the bilabiate corollas. The outer lip often is much longer than the inner; both not infrequently are toothed. Two genera are in cultivation, *Gerbera* and, to less extent, *Chaptalia*. In the latter genus the outer ray-flowers are always ligulate, a circumstance that suggests the close relationship of this group to the *Ligulaeflorae*. *Perezia*, however, is quite typical of the tribe having as it does all the corollas bilabiate. Our plant has a daisy-like aspect and until the corollas are examined might be referred to the tribe *Anthemideae* of the *Tubuliflorae*. Because of the open graceful habit of growth, the clear green color of foliage and the rather large heads (about 1.5 cm. in diameter) with white rays the plant is attractive enough to warrant growing for its beauty.

The notes upon the occurrence of this plant were kindly furnished by Mrs. Ella L. Horr of Worcester who sent to the Gray Herbarium the specimen for identification. Fortunately Mrs. Lowe transplanted the *Perezia* to a pot last fall where it has continued to blossom, and Mrs. Horr writes that there are now two plants which Mrs. Lowe will place in her wild flower garden this season in the hopes of securing fully mature achenes. In allusion to the plant as a wanderer it may be called

Perezia aletes, spec. nov., herba annua erecta ut videtur 3 dm. alta; caulibus glanduloso-puberulis vel hispidulis gracilibus deorsum simplicibus, sursum corymboso-paniculatis; foliis radicalibus rosulatis breviter petiolatis vel subsessilibus oblongis acutis subpinnatifidis circa 8 cm. longis, segmentis ovatis cuspidatis sed non spinulosis,

viridibus parce glanduloso-ciliatis; foliis caulinis inferioribus consimilibus sed brevioribus basi auriculatis, superioribus gradatim reductis fere integris solum ad apicem et ad basin paullo dentatis; capitulis multifloris pedunculatis, pedunculis plus minusve bracteolatis; involucris late campanulatis circa 1.5 cm. diametro; involucri squamis subbiseriatis herbaceis, interioribus obovatis margine spinuloso-denticulatis ad basin scariosis apice subacutis circa 9 mm. longis, exterioribus angustioribus circa 7 mm. longis rare denticulatis, omnibus parce subglanduloso-hispidulis; corollis albis florum radii circa 12 mm. longis, tubulo circa 4 mm. longo, labia exteriore oblonga circa 8 mm. longa 3 mm. lata apice obtusa minute tridentata, labia interiore circa 3.5 mm. longa acuminata integra; corollis florum disci abbreviatis; pappi setis circa 30 scabriusculis brunneis circa 6 mm. longis; achaeniis 4 mm. longis dense hirto-pilosis.

Annual erect herb about 3 dm. high with a basal rosette of subsessile oblong acute subpinnatifid leaves 8 cm. or more long, segments ovate, cuspidate, sparsely glandular-ciliate: lower stem-leaves similar but smaller, auriculate at base, upper gradually reduced and nearly entire, somewhat dentate only toward the base and apex: stems slender, glandular-puberulent or hispidulous, corymbosely paniculate above: heads pedunculate, many-flowered, peduncles more or less bracteolate: involucre broadly campanulate, about 1.5 cm. broad: bracts indistinctly 2-seriate, herbaceous, the inner obovate, subacute, margin spinulosely denticulate scarious toward the base about 9 mm. long, outer bracts narrower, about 7 mm. long, rarely denticulate, all slightly glandular-hispidulous: corollas white, radiate about 12 mm. long, tube about 4 mm. long, outer lip oblong, about 8 mm. long, 3 mm. broad, minutely tridentate at the obtuse apex: inner lip about 3.5 mm. long, acuminate, entire: disk-corollas smaller: pappus-setae brown, minutely scabrous, about 6 mm. long: achenes 4 mm. long, densely hirsute-pilose.— Massachusetts: adventive in vegetable garden fertilized with foreign wool-waste, North Worcester, 1917; communicated by *Mrs. Ella L. Horr*, April 9, 1918 (type, Gray Herb.).

Gray Herbarium.

Carex paupercula Michx., var. **brevisquama,** n. var., squamis 3–4 mm. longis perigynium subaequantibus.

Scales 3–4 mm. long, about equalling the perigynium.— Quebec: Ile-aux-Coudres, Charlevoix Co., June, 1917, *Bro. M.-Victorin,* no. 4021 (type in Gray Herbarium).

Remarkable in its very short scales which give the plants a distinctive aspect, the long-acuminate scales of typical *C. paupercula* being 5–8 mm. in length and much exceeding the perigynia.— M. L. Fernald, Gray Herbarium.

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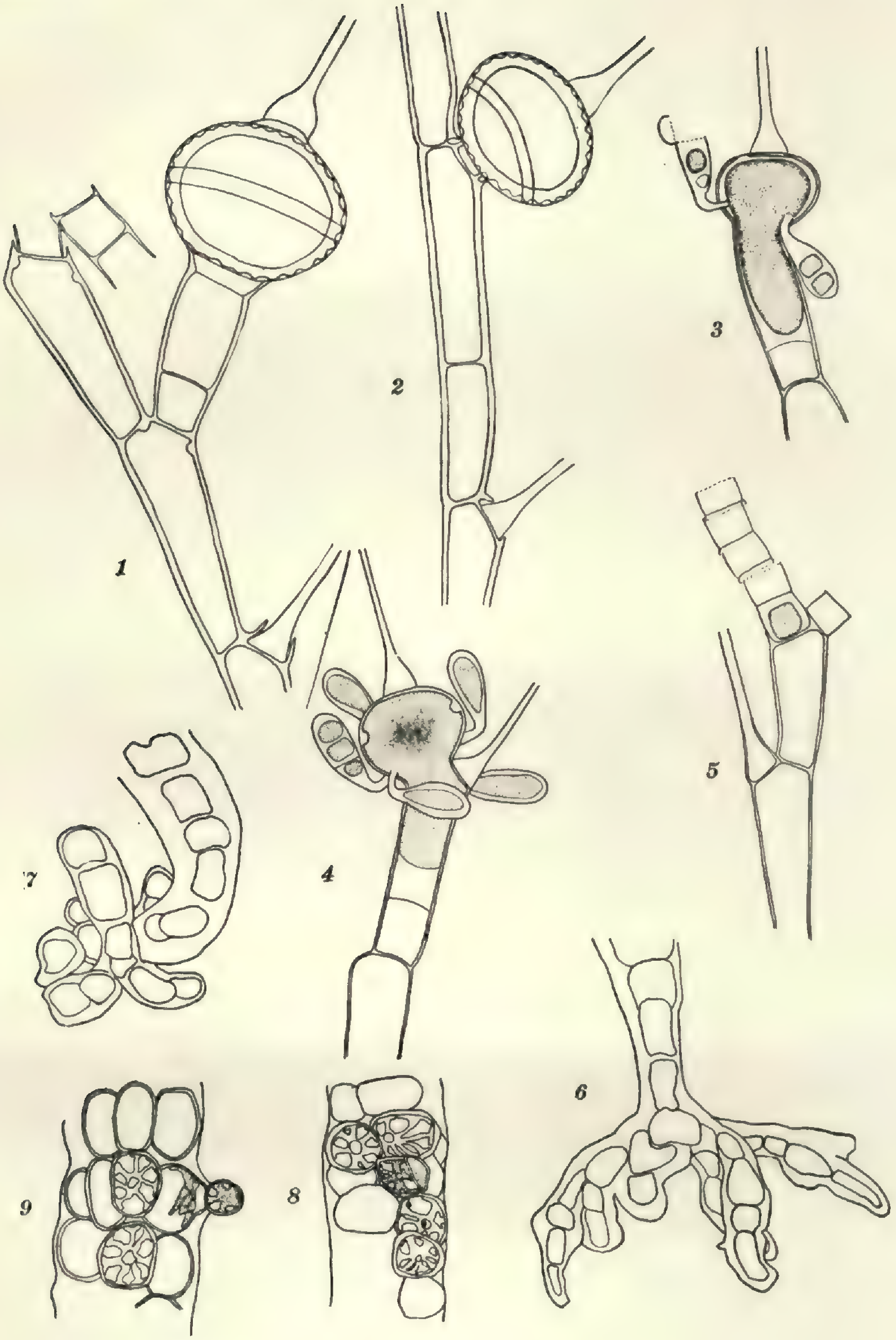

FIGS. 1–5. BULBOCHAETE FURBERAE.
" 6–9. ERYTHROTRICHIA RHIZOIDEA.

Rhodora

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PRESSING PLANTS WITH DOUBLE-FACED CORRUGATED PAPER BOARDS.

George E. Nichols and Harold St. John.

The advantages to be gained by using corrugated paper boards in plant presses was first made widely known by Collins who, in 1910,[1] described his own experience with them, together with that of several other workers who independently had developed similar methods. Briefly outlined, the scheme originally employed by Collins was as follows. In building up a press, single-faced (s. f.) corrugated boards, i. e. boards in which one face is uncovered and ridged, the other covered and smooth, were substituted for the driers customarily employed, the specimens, enclosed only by thin specimen sheets of newspaper stock, being laid directly between these. After being strapped up the press was suspended over a lamp, and around it was tied a cloth skirt, draped so as to hang nearly to the floor, and "held open by means of a stiff wire hoop sewed in at the lower edge." The effect of the continuous current of warm air from the lamp, guided by the skirt and passing upward through the corrugated ventilators, was such that, to quote Collins (*l. c.*, p. 222), "plants which formerly took a week to dry can almost invariably be perfectly dried in less than 24 hours, and commonly in less than 12 hours." Furthermore, there was the added advantage that the bother of changing driers and spreading out the wet ones to dry was entirely eliminated.

Collins experimented with various modifications of the method

[1] Collins, J. F. The use of corrugated paper boards in drying plants. Rhodora **14**: 221–224. 1910.

just described and found that somewhat better specimens could be obtained, though not so quickly, by using ordinary driers in combination with the corrugated ventilators: a drier was placed over the ridged face of each board, so that the sheet containing the specimen lay between a drier on one side and the smooth face of a ventilator on the other. This scheme was essentially the one used in the field by Professors M. L. Fernald and K. M. Wiegand, "except that one change of driers was made in order to straighten folded leaves, etc." (*l. c.*, p. 223). It was found that such a press could be left without attention for several days, even in a humid climate. Finally, Collins suggested the practicability of using various sources of heat other than the lamp, such as an oil stove, electric heater, cook stove, steam radiator, etc.

Three years later Ricker,[1] in a government circular designed primarily to instruct novices in the preparation of presentable botanical specimens, recommended the use of corrugated boards in combination with driers for pressing, advising that the specimen sheet be separated from the ventilators on both sides by driers. He recommends double-faced (d. f.) boards, i. e. boards with both faces covered and smooth, in preference to the single-faced type, and stipulates that the corrugations should run lengthwise the board. Regarding the use of the d. f. board Collins (*l. c.*, p. 223) was of the opinion that although "it is better to handle, and can be used either side up, it appears doubtful at present if it has any particular advantages otherwise over the single-faced."

The primary object of the present paper is to proclaim the advantages of the d. f. board ventilators, and to describe briefly our experience in using them under diverse conditions, with the hope that others may profit by our results. During the summer of 1915 and again in 1916 the senior writer spent about two months in ecological investigations in northern Cape Breton.[2] As a desirable adjunct to these studies considerable attention was devoted to the flora of the region, and something over 2000 sheets of vascular plants were prepared. For pressing and drying, d. f. corrugated boards, cut with the corrugations running lengthwise, were used, driers being omitted except with occasional

[1] Ricker, P. Z. Directions for collecting plants. U. S. Dept. Agr. Bur. Pl. Ind. Cir. 126. pp. 27–35. *f. 1–5.* 1913.

[2] See Nichols, G. E. The vegetation of northern Cape Breton Island, Nova Scotia. Connecticut Acad. of Arts & Sciences **22**: 249–467. f. 1–70. 1918.

bulky specimens. Altogether only about 75 boards were taken into the field. The general scheme followed was that described by Collins and needs little further comment. As a source of heat an ordinary kerosene lantern was used. Incidentally, in this connection, it was found that, in addition to an abundant supply of oil, a stock of extra wicks was essential, since, with the lantern running continuously day and night, the wick had to be well trimmed at least once and preferably twice a day. About a month of each summer was spent in permanent camp, and during this period the press was hung in a special shelter: the first summer in a makeshift tent, roofed with tarpaulin and walled with boughs; the second summer in a small hut constructed out of tar-paper and scantlings. The latter part of each summer was spent partly in localities where "hotel" accommodations were available, partly in trips of about a week's duration through an uninhabited wilderness where all luggage had to be packed and carried. On these latter jaunts little attempt was made to dry specimens properly, but at the hotels it was customary to run the press as usual, suspending it by means of home-made wire hooks between the backs of two chairs.

The experience gained during these two summers demonstrated conclusively the worth of d. f. driers. As a rule plants were left in the press for 24 hours, the press being reversed at the end of 12 hours to insure even drying toward both ends of the press. This length of time sufficed to completely dry ordinary specimens, and even *Mertensia*, a notoriously difficult subject, was out of the press within three days. It should be interpolated, however, in the light of more recent experience, that boards cut with the corrugations running crosswise give more satisfactory results than those with corrugations running lengthwise. With the latter there is a tendency for parts lying near the center of the press to dry slowly, a tendency which is quite obviated where the corrugations run crosswise. The specimens prepared by the method just described are all that could be desired, and are noticeably superior to those prepared with the help of s. f. driers alone. Even *Mertensia* makes a fairly presentable specimen, retaining its color at least much better than any other specimens we have seen. As might have been expected, by the end of the first summer all of the ventilators showed unmistakable signs of service, and many of those that had had the misfortune to lie next to bulky specimens were pretty much out of commission. But that they stood up well under the test is demonstrated by the fact that many of them were again used throughout the second season.

In July, 1917 we contemplated a long, hard canoe trip in northwestern Maine, with the collection of plants as our primary object. From the start nearly to the finish of our 250 mile journey we realized that it would be necessary to depend on what could be carried in two canoes, together with what could be obtained from the woods. It was obvious that botanical equipment must be reduced to a minimum and yet at the same time be absolutely dependable. In view of the satisfactory results obtained by the senior writer with d. f. ventilators, this part of the equipment was quickly settled upon. A second matter demanding attention was the source of heat. With the prospect of long, hard days of poling and dragging the canoes upstream and of at least one long portage we hesitated about loading down with a three weeks supply of oil. So, at the suggestion of the junior writer, it was decided to place our dependence on a campfire — with what success will be seen. In addition, then, to sundry press frames, straps, and specimen papers, our equipment for preparing specimens, as finally boiled down, consisted of two hundred d. f. corrugated boards, cut with the corrugations running crosswise, fifty Washington driers (the purpose of which will be pointed out presently), and an abundant supply of matches. Thus armed, we sallied forth into the wilderness.

In the preparation of specimens our general method of procedure was somewhat as follows. The freshly collected plants were placed in pressing papers and press number one was built up of these plus occasional interlarded driers. It will be seen that driers were not eliminated completely, but for the most part they were used only in connection with this first press, and here primarily to place on either side of the heaviest plants, thus protecting their neighbors from undue crushing. To a certain extent they were also used between groups of specimen sheets and to even up the press. For these purposes it was not necessary that they should be thoroughly dried out after each application. Press number one was then strapped up tightly and set aside for from twelve to twenty-four hours. Ordinarily it traveled a day in the canoe, wrapped securely in a waterproof bag. At the end of this time it would be unstrapped and the entire bale of plants carefully worked over, leaves which were crumpled or out of place being straightened or shifted, flowers or fruits being brought into due prominence, etc. From the specimens thus treated would be built up press number two, this time with a ventilator alternating

with every specimen sheet. After this fashion a stack might be built up to a height of sometimes two feet or more.

In strapping up this final press, the straps were placed crosswise the press, a foot or more apart, with both buckles on the same side of the press — one of the open sides. For straps, broad, webbing trunk straps were used: these can be adjusted much more easily than leather straps and are much stronger. These straps were twelve feet in length and by tying together the free ends, a loop of any length desired could be made, by which the press could be hung up to dry

The press was now ready for the fire. At first thought it seemed like tempting Providence to entrust our plants to an open fire, but experience showed that with due care there was little danger. Only twice during our trip, the first and the last day in camp, did any catastrophe threaten: the first time due to lack of experience, the last due to an overzealous attempt to exceed the speed limit in the drying process. On both occasions the press was rescued before any serious damage had been done.

The matter of fuel was the occasion of considerable experimentation. Coniferous wood burns too rapidly and flares up too much. Of the woods available in the region traversed, alder makes the hottest fire, but the sticks are small and a green alder fire of the sort required demands constant nursing. We finally settled on green paper birch. This was everywhere available, was easy to cut and split, and once started produced a hot fire, but without too many sparks or too much flame and smoke, a fire which could be depended on for a maximum continuous supply of heat with a minimum amount of attention, especially after it had been tamed down to a glowing bed of coals.

For holding the press in position over the fire a tripod was constructed from light saplings about ten feet long, bound together at the smaller ends with a piece of cord. The tripod was straddled over the fire and the press suspended from the projecting end of one of the saplings (one of which it was our custom to cut short for this purpose), broadside over the fire and at such an angle that the channels in the ventilators would lie in a vertical position. The height of the press above the fire was determined approximately beforehand by lengthening or shortening the loop, but both height and position could be subsequently regulated by shifting the legs of the tripod. With a slow fire the press could be left at a height of barely two feet above the coals without danger, but the "coefficient of safety" naturally varies and can be judged only by experience.

The results obtained by the method just described were fully as satisfactory as those secured when a lantern was used as a source of heat, and indeed material could be dried even more rapidly. Under favorable conditions completely dried specimens could be turned out in from three to five hours: specimens in which the natural color was retained far more perfectly than in plants prepared by the ordinary slower methods of drying, and which showed no ill effects from their hot air treatment save a slight smoky smell which soon vanished. Only in exceptional cases was the imprint of the corrugations to be detected in the finished product. Wind and rain were two of the chief enemies with which we had to contend. To avoid the former we always looked for a sheltered pocket among the evergreens where the tripod could be set up. Sometimes we rigged up a make-shift wind-break with a pack-cloth, while in wet weather a pack-cloth draped tepee-fashion around the top of the tripod served the double end of keeping the press dry and the fire alive. These, however, are two enemies against which on another trip more preparation would be made beforehand.

As with the lantern method, the d. f. ventilators stood up remarkably well. They showed some effects of their hard usage, to be sure, and after being in service for a week, with the smoke constantly rising through their pores, they began to smell like a lot of kippered herring, but what real camper would object to that! And notwithstanding that all the ventilators were in practically continuous service for twenty-four days, not one was actually rendered useless.

In conclusion, a few observations of a general nature regarding the relative merits of the current methods of drying vascular plants for herbarium specimens. The following remarks pertain more especially to field operations, but in large measure they are quite as applicable to herbarium or home practise. In the matter of driers or their "equivalents", four possibilities are open: driers, s. f. ventilators, s. f. ventilators plus driers, and d. f. ventilators. Furthermore there is the choice between various sources of artificial heat or no artificial heat at all. In deciding upon the relative efficiency of various methods, there are perhaps five principal factors to be taken into account: (1) length of time required to dry specimens and (2) quality of results; and (3) weight, (4) durability, and (5) convenience in handling of the drying equipment. Sufficient objections to driers alone are furnished by the first and third factors; to s. f. ventilators

alone by the second and fourth. As to the relative merits of s. f. ventilators plus driers versus d. f. ventilators, it should be said that the results obtained with the former of these two equipments are quite equal to those obtained by the latter, but the first, third, fourth and fifth factors mentioned above are all in favor of the d. f. ventilators. Using the first equipment it takes several days to dry a load of plants, while with the second a full capacity load can be turned out each day. In this connection it should be remarked that the "Washington" drier is far superior to the ordinary type in its greater absorbent power, thinness, firmness, and strength. So far as bulk and actual weight are concerned, equal quantities of s. f. ventilators plus driers, on the one hand, and of d. f. ventilators, on the other, are about equally matched: one hundred d. f. ventilators were found to weigh $28\frac{1}{4}$ pounds, as compared with $15\frac{5}{8}$ and $13\frac{1}{4}$ pounds for the same quantities of s. f. ventilators and Washington driers respectively. But the great saving in both bulk and weight is seen when account is taken of the speed with which results can be obtained by using the d. f. ventilators. On an extended collecting trip a given number of d. f. ventilators will turn out as many dried specimens as three or four times their number of s. f. ventilators plus driers. Add to this the greater convenience in handling and the superiority of the d. f. ventilators can hardly be questioned.

With regard to the use of artificial heat, it is our opinion, based on several years' experience, that so far as the quality of results is concerned no potent objection can be urged against it: on the contrary, as earlier indicated, the specimens dried in this way are obviously superior to those dried without heat. Moreover the saving of time and energy and, in the field, of weight and bulk are big items. As to the source of heat, for field work either a lantern or a fire is satisfactory. It must be admitted, however, that a fire does require more or less constant attention, and that on this account, where it is practicable, a lantern is to be preferred, since, while it does not produce results quite as rapidly, the lantern requires much less supervision and can be left on duty day and night.

For use in the laboratory the senior writer has found great satisfaction in the following equipment. A rectangular wooden box about three feet high and open at the top was constructed. The width of the box is slightly more than the length of a pressing frame; its length is immaterial, but is sufficient to accommodate a press about two feet

thick. An inch or so below the rim of the box, lengthwise on either side, was fixed a wooden ledge. The press, instead of being suspended from above, is supported on this ledge and is girded with a canvas skirt which hangs down well below the upper edge of the box. As a source of heat a small electric stove is used, the connecting cord of which passes out through one of several holes which have been bored in the sides of the box near the base.

THE SPECIFIC VALIDITY OF LIMOSELLA SUBULATA.

M. L. Fernald.

One of the most characteristic plants of tidal flats, brackish shores and borders of salt marshes in eastern North America is the little matted and creeping plant which is known in our floras as *Limosella aquatica*, var. *tenuifolia*, or sometimes as a distinct species, *L. tenuifolia*. Our plant, treated either as a variety of *L. aquatica* L. or as a species, *L. tenuifolia* Wolf, is thus inferred to be identical with the European *L. tenuifolia*. But so far as the writer is able to determine, Wolf's species, *L. tenuifolia*,[1] is merely a dwarfed form of the European *L. aquatica*, with the leaf-blade very short and linear instead of narrowly elliptic. This is the estimate of the European *L. tenuifolia* by essentially all European authors, including Hoffmann who originally published it not as a true species but as subordinate to *L. aquatica*; and it has been so regarded in Europe for nearly a century, Schübler & Martens as early as 1834 calling it *L. aquatica β. L. tenuifolia*,[2] a nomenclatorial combination which has been repeatedly published as new by different subsequent authors even down to the year 1909.

Limosella aquatica L. is a characteristic European plant found also in southern Labrador and generally over the western portions of temperate North America, having leaves with definite blades varying from oblong to elliptic in the commoner form of the plant or narrowly oblanceolate to barely linear in the more reduced forms (var. *tenuifolia*).

[1] Wolf. ex Hoffm. Deutsch. Fl. ed. 2, i. part 2, 29 (1804).
[2] Schübler & Martens, Fl. von Würtemb. 396 (1834).

This plant, *L. aquatica*, with definite leaf-blades has a pronounced rosette-habit, forming ordinarily circular rosettes with the branches decumbent and producing tufts of leaves and numerous flowers at the tips and sometimes again proliferating. In wet habitats the species roots freely at these points of proliferation, but the specimens from Europe, as well as from western America, all show that the individual plants are fairly circumscribed and do not creep extensively. European plates such as those of Reichenbach,[1] Flora Danica (table 69) or Sowerby [2] excellently display the habit and foliage of *L. aquatica*. The plant in Europe, as well as in North America, occurs in fresh soils, chiefly in sandy margins of lakes and ponds, or, as expressed by Syme, "places where water has lain in winter." The plant of the Atlantic seaboard of North America, on the other hand, has absolutely no leaf-blade, the leaves being filiform or nearly terete; and the plant has a very closely repent, matted habit, forming dense turf, with the closely creeping stolons setting under favorable circumstances lines of new tufts, often extending in rows some decimeters away from the parent rosette. The plant is so closely repent that it is impossible in the material from the Atlantic seaboard to find any specimens in which the tufts of foliage are not conspicuously rooting at base and the plant is usually so matted as to form a turf almost impossible of disentanglement. This closely matted or creeping plant of Atlantic America is found strictly in saline or subsaline soils, always on the coast, the only specimens from inland stations coming from points not further than one or two miles from the sea.

It would therefore seem very improbable that the plant of eastern America, from Newfoundland and the lower St. Lawrence to New Jersey and eastern Pennsylvania, is conspecific with the plant of quite different habit, which is so widely spread in fresh habitats over Europe and western America. Many attempts have been made in the past to separate our coastal plant, but, so far as the writer can find, these have all proved unconvincing, and the Atlantic coast plant has been left in all recent treatments either as *L. aquatica* or as the European dwarfed var. *tenuifolia*. The first attempts to distinguish the American from the European plant were made early in the last century when the species was discovered in southern New England and on the lower Delaware. In 1816 Messrs. H. N. Fenn and M. C.

[1] Reichenbach, Ic. Fl. Germ. xx. tab. 1722 (1862).
[2] Sowerby, Engl. Bot. ed. Syme, vi. tab. 968 (1873).

Leavenworth discovered the plant at New Haven, "on the margin of the river, where it was covered by every tide";[1] and later in the year Dr. Eli Ives of New Haven collected it in brackish soils "in great abundance in the Housatonic and in most of the rivers which empty into Long-Island Sound, within the range of the tide," and he also stated in his publication that "it has been found this year [1817] by Messrs. Nuttall and Collins, on the banks of the Delaware near Philadelphia."[2] Dr. Ives felt that he had a new species, which he published with a very full description, as *L. subulata*.[2] Simultaneously Nuttall was writing up the same plant and his description of it appeared while Dr. Ives's description of *L. subulata* was in press, Nuttall identifying the plant as the European *L. tenuifolia*, but giving a very detailed account of his material, which came from "miry and gravelly banks of the Delaware, subject to the overflowings of the tide, in New-jersey and Pennsylvania, near Kensington, in the suburbs of Philadelphia" "also in Connecticut; — Dr. Ives, in a letter to Z. Collins, Esq."[3] Nuttall's description was quite as detailed as that of Ives, but as noted, Nuttall treated his plant as *L. tenuifolia* Wolf.

Somewhat later, in 1833, Rafinesque described the plant of New Jersey as a new genus, *Ygramela*, with the species *Y. maritima*[4] but with the pharisaical desire to be on both sides of the fence, like some modern authors, he added the comment: "If some Botanists will unite it to *Limosella*.... they may call it *L. maritima*." In his discussion Rafinesque laid much stress upon the habit of the plant, saying "it has the habit of *Limosella*, but forms a compact short turf."

All subsequent authors, so far as the writer can determine, have maintained our plant as identical with the European *L. tenuifolia*, sometimes as a variety, sometimes as a species, but with no statement of additional characters. A close inspection shows, however, that there are certain tendencies which are fairly constant and which indicate that our plant is probably best treated as a distinct species of eastern America. The leaves and habit have already been discussed. European authors are essentially unanimous in their statement that the corolla of *L. aquatica* is pink or flesh-color, only occasionally white; but the plant of the maritime sands and marshes of eastern America

[1] Ives, Am. Jour. Sci. i. 74 (1819).
[2] Ives, Trans. Physico-Medical Soc. N. Y. i. 441 (1817).
[3] Nutt. Journ. Acad. Nat. Sci. Phil. i. 115, 116 (1817).
[4] Raf. Atl. Journ. i. 199 (1833).

has the corolla white or at most with a bluish tinge on the outside. The calyx of the European plant is uniformly described and illustrated as regular; but in the plant of eastern America the calyx, although sometimes nearly regular, usually has the lobes somewhat united in twos, a character pointed out by Dr. Ives in his original description of *L. subulata*, when he laid much emphasis upon this point. The material of *L. aquatica* from western America agrees with the European in its very regular calyx and the descriptions of the plant of western America state that the corollas are usually pink. In *L. subulata* the scapes are very quickly recurved, so that the fruiting plants form a close tangle of arching and interlocking scapes. In the European species this arching is much less conspicuous, as it is in the material of *L. aquatica* in western America, where many of the scapes stay quite straight and erect until maturity, although some arching is found in *L. aquatica*. The style of *L. subulata* is more slender and delicate and usually more curved than in *L. aquatica*, in which the style is straight and comparatively short, although the difference is a minute one and better seen by comparison than indicated by measurement. In the capsule of *L. aquatica* the margins of the valves are thickened so that the dehisced valves appear to have a "wire-edge," but in *L. subulata* the edges of the valves are without this thickening, being thin and often more or less involute in the old capsules. Attempts have been made to find stable characters in the seeds but thus far these have failed, although there are occasional specimens which show recognizable differences; but in view of the very different habit of *L. subulata* and its uniformly saline or brackish habitat, its strictly bladeless leaves, its white corollas, its usually irregular calyx and the thin-edged valves of its capsules, it would seem that *L. subulata* should be recognized as a valid species of the brackish and saline shores from Newfoundland and the lower St. Lawrence to the lower Delaware River.

The only material of *L. aquatica* yet known from eastern America is from the southeastern corner of the Labrador peninsula, where it was collected in 1882 by the late John A. Allen and more recently (in 1915) by Dr. St. John on sandy pond shores, just within the Straits of Belle Isle. The material is immature in both instances but presents no characters which seem to separate it from the common *L. aquatica* of Europe and of western America, but it is noteworthy that this plant of fresh sands and pond-shores is not found generally

about the Gulf of St. Lawrence or in Newfoundland, where *L. subulata* abounds in brackish habitats or in the salt marshes. Certain specimens from the Andes of Bolivia strongly simulate *L. subulata*, but they are very immature and until further material is available, it is impossible to say anything of their exact identity. It would be highly improbable, however, though not without precedent, that *L. subulata*, which in North America seems so definitely confined to the temperate Atlantic shores, should also occur in the Andes.

The nomenclatorial history of *Limosella subulata* may be summarized as follows:

LIMOSELLA SUBULATA Ives, Trans. Phys.-Med. Soc. N. Y. i. 441 (1817), Am. Journ. Sci. i. 74 (1819). *L. tenuifolia* Nutt. Journ. Acad. Nat. Sci. Phil. i. 115 (1817), not Wolf. *Ygramela maritima* Raf. Atl. Journ. i. 199 (1833). *L. maritima* Raf. l. c. (1833). *L. aquatica*, var. *tenuifolia* Torr. Fl. N. Y. ii. 40 (1843), not Schübler & Martens, Fl. von Würtemb. 396 (1834).

GRAY HERBARIUM.

REPORTS ON THE FLORA OF THE BOSTON DISTRICT,—XXVIII.

THIS list includes a large number of waifs, mostly wool-waste plants from the West and from southern Europe. Few if any of them have really persisted and spread, but it has seemed well to include them, as they are all represented by identifiable specimens, and as many of them have already been published in Dame & Collins's Middlesex Flora. The specimens have been carefully compared with authentic material in the Gray Herbarium.

Our knowledge of these interesting plants is due chiefly to those earnest collectors, Dr. Charles W. Swan, Charles E. Perkins, Rev. W. P. Alcott, Miss Emily F. Fletcher and Mrs. C. N. S. Horner. Mr. Alcott's collections are poorly represented in the Club Herbarium, so, if any reader knows where the main Alcott herbarium is kept, he will do a service by notifying the committee.

LEGUMINOSAE.

AMORPHA.

A. FRUTICOSA L. Escaped from cultivation at Lynn, Arlington, Boston, Halifax, Sharon, probably elsewhere.

AMPHICARPA.

A. monoica (L.) Ell. Open woods throughout.

A. Pitcheri T. & G. Damp woods, Oak Island, Revere (*W. P. Rich*, Aug. 25, 1893; *C. H. Knowlton*, Aug. 10, 1906); thicket, border of Mystic Lake, Winchester (*W. P. Rich*, Aug. 21, 1887); rich woods, slopes of Horn Pond Hill, Woburn (*M. L. Fernald & Bayard Long*, Oct. 5, 1913).

APIOS.

A. tuberosa Moench. Moist thickets, common throughout.

[*Arachis hypogaea* L. (peanut) comes up occasionally in waste places. Reported from Cambridge and South Boston.]

ASTRAGALUS.

A. CONTORTUPLICATUS L. Wool-waste, J. V. Fletcher farm, Westford (*Miss E. F. Fletcher*, June —, 1911). Native of southern and western Europe and the East. See RHODORA xiv. 56, 1912.

A. GLYCYPHYLLOS L. Vacant lot, escaped from Fenway, Boston (*W. P. Rich*, Aug. 2, 1906 et seq.) Native of Europe and the East.

BAPTISIA.

B. tinctoria (L.) R. Br. Dry sandy and rocky soil, common throughout.

CASSIA.

C. Chamaecrista L. Dry sand, occasional from Everett, Medford, Arlington and Littleton southward; not reported from Essex country.

C. marilandica L. Moist soil at fifteen scattered stations; at some places probably introduced.

C. nictitans L. Sandy soil, well distributed throughout.

CICER.

C. arietinum L. Dump, Dorchester (*J. R. Churchill*, July 10, 1904). Specimens in herb. J. R. Churchill and N. E. Botanical Club. Native of southern Europe.

CLADRASTIS.

C. lutea (Michx. f.) Koch. Scattered trees growing spontaneously, Brookline (*F. F. Forbes*, June 9 and Sept. 25, 1902).

COLUTEA.

C. arborescens L. Introduced at S. P. Fowler place, Danvers (*Mrs. C. N. S. Horner*, no date); railway embankment, Wakefield (*R. C. Bean*, Sept. 23, 1916); roadside, Cambridge (*A. S. Pease*, Aug. 8, 1908).

CORONILLA.

C. scorpioides (L.) Koch. Charlestown (*C. E. Perkins*, July 23, 1881). Specimen in herb. N. E. Botanical Club. Native of Mediterranean region and Persia.

C. varia L. Escaped at Concord, Boston (Back Bay) and Hyde Park. [Dr. C. W. Swan's plant from Westford, reported in Dame & Collins, Fl. Middlesex Co. 29, 1888 is too poor a specimen to be verified.]

CROTALARIA.

C. sagittalis L. Sandy soil, at twelve scattered stations. Collected from Winchester in 1853, from Cambridge in 1824 and from Needham in 1834.

CYTISUS.

C. scoparius Link. Brookline (*E. & C. E. Faxon*, Aug. 28, 1887).

DESMODIUM.

D. bracteosum (Michx.) DC. Dry open woods, rare; Wenham, Lowell, Woburn, Melrose, Malden, W. Roxbury, Canton, Natick, Needham.

D. canadense (L.) DC. Dry soil, common.

D. canescens (L.) DC. Dry open woods, rare; Ipswich, Natick, Winchester, W. Cambridge, Revere, Waltham; roadside, Arlington, August, 1853 and 1869 (*Wm. Boott*), according to Dame & Collins, Fl. Middlesex Co. 27, 1888.

D. Dillenii Darl. Dry open woods; numerous stations in Middlesex and Norfolk counties. Not reported from Suffolk and Plymouth counties, and only collected from Georgetown and Wenham in Essex County.

D. grandiflorum (Walt.) DC. Rich woods, frequent.

[*D. glabellum* (Michx.) DC. Reported from "Mass." in Gray's Manual, 7th ed. Investigation at the Gray Herbarium shows that this report is based on a specimen collected by J. W. B. (John Wright Boott) in 1832. The label is in Francis Boott's writing. The sheet went to the Herb. Benthamianum in 1854, thence to the Gray Herbarium. On the herbarium sheet some unknown hand, evidently English, has written in pencil "Boston, U. S. A." There is therefore no reliable information as to where this plant of John Wright Boott's was collected.]

D. marilandicum (L.) DC. Dry open woods, occasional. Apparently rare in Essex county.

D. nudiflorum (L.) DC. Dry open woods, common.

D. obtusum (Muhl.) DC. Rocky woods, rare; Dracut, Bedford, Concord, Brookline, W. Roxbury, Needham.

D. paniculatum (L.) DC. Dry open woods, occasional; only collected from Danvers in Essex county, and from none of the towns south of Randolph and Sherborn.

D. rigidum (L.) DC. Dry woods, frequent in Middlesex county. Only collected from Andover and Georgetown in Essex county, and no reports south of Blue Hill and Hingham in Norfolk and Plymouth counties.

D. rotundifolium (Michx.) DC. Dry woods, apparently well distributed.

GENISTA.

G. tinctoria L. Introduced at Salem in the earliest days of the colony, and very abundant in pastures there, a wonderful sight about July 4; spreading throughout Essex county and sporadic at several other places.

GLEDITSIA.

G. triacanthos L. Occasional; the two stations at Sherborn and Malden may be self-planted; other trees probably merely persistent.

GLYCYRRHIZA.

G. lepidota (Nutt.) Pursh. Dump, Lawrence (*A. S. Pease*, June 10, 1903 and June 23, 1904); wool-waste, N. Chelmsford (*Miss E. F. Fletcher*, Sept. 5, 1917).

HOSACKIA.

H. americana (Nutt.) Piper. Back yard, Needham (*T. O. Fuller*, Aug. 20, 1898). Specimen in herb. N. E. Botanical Club. Fugitive from west of the Mississippi.

LATHYRUS.

L. Aphaca L. Boston (*C. E. Perkins*, July 6, 1878). Native of Europe and the East.

L. maritimus L. Sea-beaches along the coast.

L. maritimus L., var. **glaber** (Seringe) Eames, Rhodora xi. 95, 1909. Sea-beaches at Plum Island, Gloucester, Manchester and Revere.

L. palustris L., var. **pilosus** (Cham.) Ledeb. (Rhodora xiii. 47–52, 1911). Meadows and brackish marshes, all along the coast.

L. pratensis L. Cultivated field, Concord 1891, A. W. Hosmer in Rhodora i. 223, 1899. This has also been secured at Concord this year by Wm. Brewster on a dry grassy hilltop in Miss Mary Eaton's estate adjoining Sleepy Hollow Cemetery. Mr. Brewster collected it on June 27, and reports that it is definitely established

there, forming mats over an area larger than a good-sized room. It is not now grown in gardens there. Specimens in Herb. Gray and N. E. Botanical Club.

L. SATIVUS L. Dump, Lowell (*C. W. Swan*, Aug. 4, 1884). Specimen in herb. N. E. Botanical Club. Fugitive from Europe.

LESPEDEZA.

L. Brittonii Bicknell. Blue Hill Reservation, Milton (*G. G. Kennedy*, Aug. 29, 1909); Muddy Pond Hills, Boston (*Edwin Faxon*, Sept. 10, 1892. This specimen in the herbarium of Columbia University, New York, was cited in the original description. See E. P. Bicknell, Torreya i. 104, 1901).

L. capitata Michx. Dry sandy soil. Common throughout.

L. capitata Michx., var. **stenophylla** Bissell & Fernald (RHODORA xiv. 92, 1912). Blue Hill Reservation, Milton (*G. G. Kennedy*, Sept. 22, 1895).

L. capitata Michx., var. **velutina** (Bicknell) Fernald. Occasional.

L. frutescens (L.) Britton. Dry open woods, common throughout.

L. hirta (L.) Hornem. Dry sandy soil, common throughout.

L. Nuttallii Darl. Dry open woods. Not reported from Essex Co., but frequent elsewhere.

L. procumbens Michx. Dry sandy soil, frequent near Boston and west to Sherborn and Framingham; apparently rare elsewhere.

L. Stuvei Nutt. Woods, Dover (*K. M. Wiegand*, July —, 1908). The specimen is in the herbarium of Wellesley College.

L. violacea (L.) Pers. Dry open woods; frequent around Boston, also collected at Andover and Danvers.

L. virginica (L.) Britton. Dry rocky woods and hillsides, common.

LOTUS

L. CORNICULATUS L. Boston (*C. E. Perkins*, ——, 1882). Specimen in herb. N. E. Botanical Club.

LUPINUS.

L. perennis L. Dry sandy soil; frequent, especially in Middlesex county.

MEDICAGO.

M. agrestis Ten. (*M. aculeata* Willd. of Dame & Collins, Fl. Middlesex Co. 26, 1888). Woollen mills at Graniteville, Westford (*C. W. Swan*, Aug. 20, 1885). Specimen in herb. N. E. Botanical Club. Native of southern Europe and Syria.

M. arabica (L.) Huds. Woollen mill refuse and waste places, rare; Georgetown, Newbury, Lawrence, Dracut, Lowell, Chelmsford, Somerville, Roxbury.

M. falcata L. Wool refuse and waste places, rare; Middleton, Lowell, Westford, Boston.

M. hispida Gaertn. Woolen mill yards and dumps, rare.

M. hispida Gaertn., var. apiculata Urban. (*M. lappacea* Lam. of Dame & Collins, Fl. Middlesex Co. 25, 1888). Parker River mills, Georgetown (*Mrs. C. N. S. Horner*, no date); Charlestown (*C. E. Perkins*, July 22, 1879); Boston (*C. E. Perkins*, —, 1882).

[M. intertexta Willd. from wool-waste Westford (*C. W. Swan*) reported in Dame & Collins, Fl. Middlesex Co. 26, 1888, is represented in herb. N. E. Botanical Club and Yale, but specimens are too young for satisfactory determination.]

M. laciniata All. Dracut or Lowell (*C. W. Swan*, Aug. 6, 1884); S. Boston flats (*C. E. Perkins*, —, 1878 and Sept. 29, 1881). Native of Mediterranean region.

M. lupulina L. Fields and waste places, common.

M. minima L. Woollen mills at Graniteville, Westford (*C. W. Swan*, Sept. 15, 1884); dump, Lowell (*C. W. Swan*, Aug. 6, 1884); sown by wool, N. Chelmsford (*W. P. Alcott*, —, 1878). One specimen of the last seems to be var. *longiseta* DC. Native of Europe.

M. praecox DC. Wool-waste at Graniteville, Westford (*C. W. Swan*, Aug. 20, 1885). Specimens in herb. N. E. Botanical Club and Yale.

M. sativa L. Fields and waste places, frequent.

MELILOTUS.

M. alba Desr. Waste places, common.

M. indica (L.) All. (*M. parviflora* Desf.) Waste places, rare; Dracut or Lowell, Westford, Cambridge, Charlestown, Boston. Native of the Mediterranean region and southern Asia.

M. officinalis (L.) Lam. Waste places, frequent.

ONOBRYCHIS.

O. VICIAEFOLIA Scop. Open field, Wellesley (*K. M. Wiegand*, June —, 1910). Specimen in herb. Wellesley College. The sainfoin or holy clover, cultivated for fodder in the southern States. Introduced from Europe and Asia.

PAROSELA.

P. DALEA (L.) Britt. (*Dalea alopecuroides* Willd. of Gray's Manual, 7th ed.) S. Boston flats (*C. E. Perkins*, Sept. 29, 1881). A waif from the West.

PISUM.

P. SATIVUM L. Waste places, occasional; seldom if ever re-seeding itself.

ROBINIA.

R. HISPIDA L. Persistent and spreading from old gardens.

R. PSEUDO-ACACIA L. Naturalized and spreading in many places.

R. VISCOSA Vent. Persistent and spreading, especially around old places.

SCORPIURUS.

S. SUBVILLOSA L. Westford near Graniteville woollen mills (*C. W. Swan*, Sept. 15, 1884.) Specimen in herb. N. E. Botanical Club. Adventive from Europe.

STROPHOSTYLES.

S. helvola (L.) Britton. Sandy shores all along the coast from Amesbury to Plymouth, but not very abundant.

C. H. KNOWLTON } *Committee on*
WALTER DEANE } *Local Flora.*

Solidago racemosa Greene, forma **leucantha**, n. f., ligulis albescentibus, floribus disci ochroleucis.

Rays whitish; disk-flowers creamy.— New Hampshire: with the typical orange-flowered form, argillaceous ledges by the Connecticut River, Bath, August 18, 1917, *Fernald*, no. 15,575 (type in Gray Herb.). — M. L. Fernald, Gray Herbarium.

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ERAGROSTIS PEREGRINA A FREQUENT PLANT ABOUT PHILADELPHIA.

BAYARD LONG.

PROFESSOR K. M. WIEGAND, in his recent study of *Eragrostis peregrina*,[1] found (exclusive of his own Ithaca material) a totality of seven specimens at the Gray Herbarium and the New York Botanican Garden, representing the occurrence in Europe, Asia, and North America of this little known weed. That two of these specimens came from the vicinity of Philadelphia — Lancaster, Pennsylvania and Mickleton, New Jersey — was a fact at once suggestive to a Philadelphian.

Only a year or two previously an occasion had arisen for me to dip into the *Purshii-pilosa* problem of *Eragrostis*. It had been concluded that our most common representative of this troublesome alliance could be separated out, with a very fair degree of satisfaction, as *E. Purshii*, but what remained as the supposed *E. pilosa* was certainly no homogeneous series. Old World material of what apparently was considered this latter species by European botanists was readily matched by quite a number of collections from the local area. But, very different superficially from *E. pilosa*, there had remained still other forms — which, perforce, for want of a better solution, had been left, as found, under this species.

The diagnostic characters of *E. peregrina* were so clearly brought out by Professor Wiegand, that, as his paper was read, there came a recollection of one of the forms which had failed of being matched

[1] Wiegand, RHODORA, xix. 93 (1917).

by Old World material — a rather low, erect plant with smallish, stiff, notably dense panicles. It was confidently felt that specimens of *E. peregrina* would be found in the local herbarium of the Philadelphia Academy. A prompt examination of this collection appeared to verify almost overwhelmingly this sanguine expectation.

It was seen that at least as early as the 60's the plant had already appeared in Philadelphia. (The Mickleton and Lancaster specimens had been collected in the late 80's.) — Specimens were found from the Martindale Herbarium labelled "Byberry, Pa. 1864." — presumably from the northern part of Philadelphia County. Two sheets by C. E. Smith, undated but probably of this same early period, had been collected in Philadelphia, one labelled "Streets of the city" and the other "Mr. Longstreth's place." E. Diffenbaugh had obtained it in 1867 on waste-ballast soil below the Navy Yard. Of these older botanists, C. E. Smith and Isaac Martindale had referred the plant to *Eragrostis pilosa* without comment, but it was of interest to note that the discerning eye of Elias Diffenbaugh had recognized it as apparently differing from both *E. pilosa* and *E. Purshii.* A note of some length has been preserved with his specimens, in which he says:

"This is the grass I called *E. Purshii?* in my list. After careful comparison with descriptions in Gray and in Chapman I am inclined to think it is not that plant. The pedicels are too *short*, and lateral nerves of lower palet not prominent enough. It cannot be *E. pilosa* as described and figured by Gray: for that plant has the lower palet *broadly ovate* and *obtuse.* It is, most likely, a southerner, and am inclined to think not described in either of the above works. E. D.

"Nov. 9, 1867"

In the summer of 1898 A. F. K. Krout secured it three times within the city limits: on Wissahickon Creek; at Cramp's [Ship Yard]; and at 13th. and Susquehanna Avenue, noting it between bricks on pavement. Between 1908 and 1910 it was obtained by other collectors from more outlying points about Philadelphia: to the south, from Delaware City, in the state of Delaware, by C. S. Williamson; to the west, at Wayne, in Delaware County, Pennsylvania, by E. B. Bartram; to the north, at Fort Washington, in Montgomery County, Pennsylvania, by myself.

The Porter Herbarium produced two sheets from Lancaster, Pennsylvania: one from the Herbarium of Mrs. A. F. Eby collected in 1898; the other, by A. A. Heller in September, 1889, doubtless

duplicate material in actuality (from a joint trip by Small and Heller) of the specimen cited by Professor Wiegand.

Search at the University of Pennsylvania was rewarded by an old specimen from Fairmount Park, Philadelphia, from the Herbarium of Isaac Burk — not dated but probably about the 60's.[1]

Professor Wiegand's interest was obtained in this Philadelphia material and through his kindness it has received his verifying determinations.

During June it was possible to identify with certainty an *Eragrostis* that for several seasons had been noted regularly appearing in the roadside gutters near my home — and thus at once begin a fuller acquaintance with *Eragrostis peregrina* almost at my own door. Here in Ashbourne and Elkins Park (contiguous suburbs nine miles north of Philadelphia) the plant occurs at quite a number of stations, invariably between the bricks used in the gutter construction on some of the newer and more improved roads. At some places where there are as yet no houses and the gutters are not kept weeded, it has become locally abundant and quite conspicuous, but, though well distributed, in general the street cleaning reduces its occurrence to small and scattered colonies. Immediately south of Elkins Park station is a large colony of many plants growing on the railroad ballast beside the Philadelphia & Reading tracks. Along a foot-path within the railroad right-of-way it is noticeable here and there in small colonies.

At Fort Washington, about sixteen miles out of Philadelphia along the Reading, the 1908 collection was verified. The plant appeared to be rather rare along the roadside in the village. Careful exploration of the main tracks and several sidings by the railroad station failed to reveal its presence in these habitats.

During July an opportunity occurred of spending a day botanizing in Bucks County, Pennsylvania with Dr. C. D. Fretz — a name especially associated with the plants of that county. My travelling to join him led me still further north on the Philadelphia & Reading. While waiting for a connecting train at Lansdale, I found *E. peregrina* to be locally abundant along the Bethlehem Branch of

[1] Here in the University Herbarium was also found among Mr. Robert Le Boutillier's Japanese Plants characteristic material of *Eragrostis peregrina*. It will be recalled that Professor Wiegand notes that its native country is not yet known. The general region of the islands of Japan being the only area in the at present known distribution of the species where apparently the plant is not definitely recorded as introduced, one naturally wonders whether it might possibly be indigenous there.

the railroad, just north of the south-bound station, growing on the edge of the railroad ballast and on the lawn turf, as well as in neglected spots between the tracks. At Doylestown (ten miles beyond Lansdale) it was again seen. Here it was noted as very common in the railroad yards by the station — at times scattered but often in close, solid colonies. In parts of the town it was found to be a not infrequent weed, occurring on the pavement- and the gutter-borders of the smaller side-streets. During the day the species was mentioned to Dr. Fretz and its characters described. Below Carversville his discriminating glance detected the plant along the roadside, and near Lumberville a great abundance of it was found locally in an exsiccated roadside gutter.

Most of my field work during 1917 being concentrated upon the Middle District of the southern half of New Jersey, a greater number of stations have been noted from this area than elsewhere about Philadelphia. Nearly all of these localities are so definitely associated with the railroads that it will not be inappropriate to group them in such connection.

To the north, observations were made at Bordentown around the Pennsylvania Railroad station. *E. peregrina* was recorded as frequent in this immediate vicinity, occurring chiefly among the cinders upon freight sidings and at the ends of several short spurs used by the shifting-engines — in general on the less used tracks which do not carry the through trains of the passenger service, and which accordingly are allowed to become weedy. Being plentiful about the freight station its occurrence upon the adjacent roadsides was readily anticipated.

Along the main line of the Pennsylvania extending eastward from Camden to the coast the species was observed at a number of widely separated localities.

At Masonville (about fifteen miles out of Camden) in the immediate vicinity of the railroad station, the freight station, and the wagon road, *E. peregrina* was found to be very abundant. There is a lengthy siding here and on the spot where freight cars are commonly dropped and teams drive up, so dominant was the species that, when seen in vigorous, fresh growth, at a distance the ground between the ties and near by presented the appearance of a lawn — and essentially all of the greenness was due to this species.

At Pemberton, over a third of the distance across the state, a few

plants were discovered in the fine cut-stone forming the concrete-curbed platform about the railroad station. Search failed to disclose the species on either the tracks or the adjacent roadside.

During early autumn a center was made at Beach Haven, and in travelling back along the railroad to botanize at various points a plant or two was detected from the train at Barnegat, on the freight siding opposite the Pennsylvania Railroad station — so characteristic-looking that the identity was felt to be almost certain. Investigation showed *E. peregrina* to be fairly frequent about the tracks, apparently occurring only on the sandy railroad ballast, however, and not on the roadsides. Barnegat is also the terminus of a branch of the New Jersey Central. On the freight sidings of the Central tracks, near by but not connected with those of the Pennsylvania Railroad, the plant was found to be a dominant weed, growing luxuriantly in the open as well as in the shade under standing cars, the station platform, and taller weeds.

Barnegat having produced the plant, the terminus of the Pennsylvania system at Beach Haven on Long Beach Island was thought likely to show another locality. The tracks and the railroad yard here are upon a considerable fill, largely of rather clean cinders, and situated almost entirely over salt marsh. Very few weeds of any kind were about the tracks and no *E. peregrina.* Further search was rewarded by finding it about South Street and the Boulevard in the central part of Beach Haven. Here it was noted as locally frequent on the sidewalks, but most abundant in the hard, exsiccated "gutter" region of the gravelled streets.

Specimens having been seen from the ballast-grounds of Philadelphia, a sharp lookout was kept for *E. peregrina* when another quest took me to the long neglected ballast region of Kaighn's Point, Camden. Within sight of the Kaighn's Point Ferry it was almost immediately detected along the weedy sidewalks of Kaighn Avenue. At this spot it was apparently rather rare, but along Ferry Avenue, not far distant, it grew luxuriantly on waste ground, associated with other widely distributed weeds.

It is readily distinguished along the tracks of the Reading system near Kaighn's Point, as one goes out by train from this terminal, but it soon drops from sight as the railroad yards and waste places are left behind, and the natural county is reached.

Extending out from Kaighn's Point for about a dozen miles, in a

general southerly direction, is the Gloucester Branch of the Atlantic City Railroad. During a number of trips back and forth over this line there was ample opportunity, while the train stopped at the numerous stations, to make car-window observations for *E. peregrina.* This is a single track road and at many of the stations there are small sidings for the accommodation of freight cars. Several localities were mentally recorded with confidence and one was properly verified by collection — at Blenheim. Here it was noted as very common about the station, being equally well distributed over the cinder ballast of both the main track and the siding.

Along the West Jersey and Seashore Railroad (of the Pennsylvania system) the plant was detected once on the Atlantic City Division and twice on the more southerly line of the Cape May Division.— A few miles below Haddonfield, at Ashland, the species was collected on the siding by the railroad station. The ballast here is very fine, hard, and compact. Very few species have been able to obtain a foothold but plants of *E. peregrina*, though all small, were frequent. In passing Woodbury by train numerous colonies of an *Eragrostis* with the habit of *E. peregrina* were observed on several occasions in the railroad yards south of the Pennsylvania station. Investigation at a later date verified the occurrence here of the species. It was seen to be widely distributed over the railroad ballast, being most abundant on the sidings, in weedy spots, and about piles of débris. Along adjacent streets it has become a conspicuous weed in the gutters and on the borders of the sidewalks. At Sewell (several miles beyond Woodbury) it was noted in an interesting habitat. Although occurring sparingly on the driveway up to the station, it was found most frequent about the railroad station hydrant, chiefly on the well-trodden area where one stands to drink.

On the Salem Branch of the Pennsylvania Railroad lies Mickleton where *E. peregrina* was collected by Benjamin Heritage in 1887. Speculation on its possible persistence induced a search at this locality on one of the last trips of the season. By this time its favorite habitat had become so well known that the freight siding by the railroad station was at once sought and almost immediately revealed the presence of the plant. Although the scrutiny of the tracks was not overthorough, the species appeared to be rather infrequent, at least in this exact spot. On this Branch two new localities were noted — Swedesboro and Harrisonville. Swedesboro is one of the more impor-

tant points on this line and consequently has a considerable system of sidings about the station. A very hasty exploration made at twilight during a few spare moments before train arrival showed its occurrence on at least one of the tracks — very abundant, both inside and outside the rails. Being driven back to Harrisonville station a half-hour before train time by a heavy rain which proved to be only a passing shower, the time was occupied in investigating the weeds on the railroad ballast — with slightly more profit than usual. The dominant plant on the freight siding immediately back of the station proved to be *E. peregrina,* in many spots forming particularly large, luxuriant colonies between the rails and ties.

A day's exploration in late July with Mr. J. P. Otis in upper Newcastle County, Delaware, produced further evidence on its occurrence in another direction. Mr. Williamson's collection at Delaware City was to be recalled, and as my train pulled into Wilmington the very weedy railroad yards at once suggested the presence of the species. Just outside the Pennsylvania station it was soon found, growing between the paving and the houses. In this situation and at the edge of the curbing it appeared to be a frequent plant of the ill-kept streets of this portion of the city. Later in the day it was picked up in an exsiccated roadside gutter south of Newport, and at Newport station it was found to be very abundant upon the nearby sidings, about the station platform, the railroad pump, and along adjacent roads and paths, covering solid areas to the exclusion of other species.

The occurrence of the plant within Philadelphia itself had been so well established by other collectors that no especial effort was made to verify these collections. But when the eye had become trained to the detection of the plant, completely to overlook it became quite impossible. It was even found to occur only a step away from the Philadelphia Academy, growing plentifully on the outer portion of the ancient brick pavement of Cherry Street near 19th Street. In travelling to and from my home, large solid colonies of apparently *E. peregrina* had been noted in the railroad yards by Huntingdon Street station on the Philadelphia & Reading. Opportunity was found between trains to investigate this spot. These yards are kept mostly quite clean but on one side, among several little used tracks, railroad débris, rails, spikes, etc., they are allowed to become weedy. Here *E. peregrina* is undisturbed and has become locally abundant.

In his assiduous exploration of Lehigh County, Mr. Harold W.

Pretz has extended the Pennsylvania distribution considerably northward in the local region. His collection is from the stone ballast of the Lehigh Valley Railroad near Slatington station.

From a comparison of the most outlying stations it will be seen that we now know the species to be fairly well distributed about Philadelphia over a radius of approximately sixty miles to the north, east, and west. The southernmost collection is at a distance of about thirty-five miles but there is every reason to believe that the plant occurs throughout southern New Jersey, and probably also considerably further south in Delaware than Delaware City.

Academy of Natural Sciences of Philadelphia.

PRICKLY LETTUCE.

L. H. Pammel.

In the fifth edition of Dr. Gray's Manual of Botany, published in 1868, this statement is made with reference to Prickly Lettuce (*Lactuca Scariola*) "Waste grounds and roadsides Cambridge, Mass., Adv. from Europe." In a paper on the distribution of some weeds in the United States, etc., which I [1] published in 1891 the statement is made that it was first observed near Hovey's Garden in 1863–64. In the next edition of Gray's Manual by Watson and Coulter [2] the distribution is given "waste grounds and roadsides, Atlantic states to Missouri and Minnesota." In the next edition by Robinson and Fernald [3] the *L. Scariola* L. is said to occur as follows; "roadsides, railway ballast, etc., s. N. E. to O., Mo., and Ky., chiefly westw.," but even then less common than the following variety *integrata* Gren. & Godr. which is said to occur in "waste grounds and roadsides, across the continent; westw. an abundant and pernicious weed."

I have seen Prickly lettuce for a great many years. The plant so common in St. Louis in 1889, at Madison in 1883, La Crosse, Wisconsin, in 1886 and in Ames, Iowa, and elsewhere in Iowa in 1889 was the variety *integrata*. I saw the true *L. Scariola* common everywhere in California and the Salt Lake basin in 1898.

During the past season I have observed the species abundant at the

[1] Proc, Ia, Acad. of Sci. 2: 109. [2] 6th. Ed. 304, 1889. [3] 7th ed. 866, 1908.

following points; Des Moines, Dallas Center, Dubuque, Clinton, Keokuk, Corwith and Sioux-City, Iowa; Hamilton, LaSalle, Peoria, Zearing, East Dubuque, Illinois; Prairie DuChien and La Crosse, Wisconsin; Mitchell and Sioux Falls, South Dakota. The var. *integrata* was the prevailing form at the following points; Forest City, Thompson, Spirit Lake, Lansing, Waukon, Postville, Sibley, Lake Park and Rock Rapids, Iowa, as well as Britt, Algona and McGregor, Iowa. This form seems to be able to hold its own better in Allamakee and Clayton county where the soil consists of clay. The *L. Scariola* seems to be adapted to conditions of drouth better than the var. *integrata*. This, I think, accounts for its abundance in the west.

The purpose of writing this note is to call attention to the rapid disappearance of the variety *integrata* from the flora of Iowa. Comparatively few of the plants can be seen at the present time in the vicinity of Ames. There were more in 1916 and 1917 than this year and I saw more in Warren county, south of Des Moines this year than in Ames. In place of this variety we have the typical form of *L. Scariola* in great abundance. It is a terrible pest in the gardens. The species proper, that is to say the form with deeply lobed leaves, was in Iowa first observed on the Lincoln Highway near the college campus at Ames in June, 1909. I have seen it increase in numbers until now it occupies every vacant lot and field. These two kinds of prickly lettuce certainly show how one plant is much more aggressive than the other. Interesting hybrids between prickly lettuce and garden lettuce are reported in Iowa.

Iowa State College, Ames, Iowa.

REPORT OF COMMITTEE ON FLORAL AREAS.

In the spring of 1917 a committee was appointed, at the suggestion of Prof. M. L. Fernald, to study the distribution of New England plants in detail, to see if it were possible to map definite floral areas. Interleaved check-lists were prepared for the more active collectors, so that casual observations as well as specimens collected could be at hand. The larger New England herbaria and the local floras available have also been included in our labors.

It seemed best to have as the backbone of our first report a preliminary list such as Rhodora readers are already familiar with. The notes following are much fuller than those with previous lists. A careful reading of these will show much in regard to floral areas, and also much about areas which are not represented by specimens. In this report on *Ranunculaceae* there are many gaps, but the committee thought best to publish, so that New England botanists may come to our assistance even more fully than they have yet done. Any error or omission may be reported to any member of the committee.

PRELIMINARY LISTS OF NEW ENGLAND PLANTS,—XXVI.

[The sign + indicates that an herbarium specimen has been seen; the sign – that a reliable printed record has been found.]

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Ranunculaceae						
Aconitum Napellus L.	+		+			
Actaea alba (L.) Mill.	+	+	+	+	+	+
" rubra (Ait.) Willd.	+	+	+	+	+	+
" " forma neglecta (Gillman) Robinson	+	+	+	+		+
Anemone canadensis L.	+		+	+		+
" cylindrica Gray	+	+	+	+	+	+
" multifida Poir., var. hudsoniana (Richards) Fernald	+		+			
" parviflora Michx.	—					
" quinquefolia L.	+	+	+	+	+	+
" riparia Fernald	+	+	+	+		+
" virginiana L.	+	+	+	+	+	+
Anemonella thalictroides (L.) Spach		+	+	+	+	+
Aquilegia canadensis L.	+	+	+	+	+	+
" " var. flaviflora (Tenney) Britton	+					—
" " var. Phippenii J. Robinson	+			+		
" vulgaris L.	+	+	+	+		+

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
RANUNCULACEAE						
Caltha palustris L.	+	+	+	+	+	+
Cimicifuga racemosa (L.) Nutt . .	+		—	+		+
Clematis verticillaris DC.	+	+	+	+	+	+
" virginiana L.	+	+	+	+	+	+
Coptis trifolia (L.) Salisb.	+	+	+	+	+	+
Delphinium Ajacis L.	+	+	+	+	+	+
Hepatica acutiloba DC.	+	+	+	+		+
" americana (DC.) Ker. . .	+	+	+	+	+	+
Hydrastis canadensis L.			+			+
Ranunculus abortivus L.	+	+	+	+	+	+
" " var. eucyclus Fernald . .	+	+	+	+		+
" acris L.	+	+	+	+	+	+
" allegheniensis Britton .		+	+	+	+	+
" aquatilis L., var. capillaceus DC.	+	+	+	+	+	+
" bulbosus L.	+	+	+	+	+	+
" Cymbalaria Pursh . .	+	+		+	+	+
" delphinifolius Torr. . .	+	+	+	+	+	+
" fascicularis Muhl. . .		—	+	+		+
" Ficaria L.				+		
" hispidus Michx. . . .			+	+		+
" laxicaulis (T. & G.) Darby	+	+		+	+	+
" longirostris Godr. (R. circinatus Sibth.) . .			+			+
" micranthus Nutt. . .				+	+	+
" pennsylvanicus L.f. . .	+	+	+	+		+
" Purshii Richards . . .	+					
" recurvatus Poir. . . .	+	+	+	+	+	+
" repens L.	+	+	+	+	+	+
" " var. erectus DC.				+		
" " var. glabratus DC.	+	+		+		
" " var. linearilobus DC.	+			+		
" " var. pleniflorus Fernald . . .			+			+
" " var. villosus Lamotte	+	+		+	+	
" reptans L.	+	+	+	+		
" " var. ovalis (Bigel.) T. & G. . . .	+	+	+	+	+	+

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Ranunculaceae						
Ranunculus sceleratus L.	+	—	—	+	+	+
" septentrionalis Poir.	+	+	+	+		+
Thalictrum confine Fernald	+		+			
" dasycarpum Fisch. & Lall.						+
" dioicum L.	+	+	+	+	+	+
" polygamum Muhl.	+	+	+	+	+	+
" revolutum DC.				+	+	+
Trollius laxus Salisb.						+

Introduced Species.

Certain introduced plants of very limited occurrence are omitted from the list. These are: *Anemone nemorosa* L., collected by J. H. Sears at Danvers, Mass.; *Clematis florida* Thumb. from Woodbridge, Conn. (Rhodora xix. 224, 1917); *Delphinium Consolida* L., a grain-field waif at Middlebury, Conn. (E. B. Harger, see Rhodora xviii. 169–176, 1916); *Nigella damascena* L. from Biddeford, Me., and Bridgeport, Conn.; and *Zanthorhiza apiifolia* L'Hér. introduced at Concord, Mass.

Aconitum Napellus L. is persistent and spreading at Pembroke, Me. (M. L. Fernald), Willoughby, Vt. (G. G. Kennedy) and at Newfane, Vt. (L. A. Wheeler); *Ranunculus Ficaria* only at Cambridge, Milton and Hingham, Mass.

Aquilegia vulgaris is frequently persistent around old places in southern New England, but further north it occasionally spreads to fields and woods and becomes an intimate part of the flora. This is especially true in Aroostook county (M. L. Fernald) and at Cutler, Me. (G. G. Kennedy), Barton, Vt. (S. N. F. Sanford) and Newport, Vt. (C. H. Knowlton).

Ranunculus acris seems to have found a footing in moist soil wherever the original native vegetation has been removed. *R. bulbosus* is a plant of dry fields, abundant in southern New England, but it is not common in Vermont nor in inland New Hampshire. It is found in York County, Me., at Portland, around Bangor, at South Deer Isle and Dennysville, and also inland at Skowhegan. *R. repens* and

its varieties seek out wet places, especially near the coast. It is apparently rare in Vermont and inland Maine, but follows the coast east to Machias Seal Island. The varieties are so recently known that separate ranges, if existent, cannot easily be assigned.

Complex Groups.

Ranunculus aquatilis, var. *capillaceus* of Gray's Manual, 7th ed., consists of two or more species. *Thalictrum polygamum* is likewise a complex group, so no conclusions can be drawn about these two at present.

Generally Distributed Species.

Anemone quinquefolia	Clematis virginiana
Actaea alba	Coptis trifolia
" rubra	Ranunculus abortivus
	" recurvatus

These species are so evenly distributed as to require little comment. Of them, however, only *Anemone quinquefolia* and *Ranunculus abortivus* have been reported from Cape Cod. It may be noted that they are all species of rich woods or moist ground.

(To be continued.)

C. H. Knowlton,
W. S. Ripley, Jr.,
C. A. Weatherby.

TSUGA CANADENSIS (L.) CARR.

Ivar Tidestrom.

The correct name for our common, northern hemlock has been recently discussed in a paper[1] by Mr. Farwell, wherein he attempts to prove that the correct name should be *Tsuga americana* (Miller) Farwell.

Mr. Rehder[2] insists upon the retention of the name *T. canadensis* for various reasons.

The writer does not wish to enter into any "intricate" discussion of a more or less vague synonymy — for those who wish to know the

[1] Bull. Torr. Club **41**: 621–629. 1914. [2] Rhodora **17**: 59. 1915.

details may read the papers cited below, but there are certain statements or queries that must be challenged by any one at all familiar with the history of Botany.

That *Pinus balsamea* L. (Sp. Pl. 1002, 1753) represents two species is agreed to by Rehder and Farwell, for the references to Ray, Plukenet and Gronovius bring into that concept of the species, *Tsuga canadensis.*

It is well known, however, that Linnaeus never intended that the synonymy cited should be considered as necessarily belonging to the plant under which it was given, but that it was possible that such was the case. This view has been held for many years by Scandinavian botanists. "*Synonyma paucissima in* Europaeis *plantis adhibui, contentus C. Bauhino & Iconographo praestantiore; in Exoticis vero plura, quum difficiliora minusque trita sint.*" (L. Sp. Pl. ed. Intr.). ....*neque in multis synonymis, sed in genuinis differentiis specificis constat artis robur.*" (L. Mant. **2**: Praef. 1771.)

The synonyms given by Linnaeus should therefore be valued as they were by him and no more. In the second edition of his Species Plantarum, Linnaeus establishes a new species *Pinus canadensis*, which from all appearances is taken out of *Pinus balsamea.* The new species is evidently based upon the plant of Gronovius [1] as described. "*Abies foliis solitariis confertis obtusis membranaceis.*" ....Clayt. n. 547. Linnaeus also cites *Abies foliis piceae brevioribus, conis parvis biuncialibus laxis.* Mill dict. t. 1, which is the plant now called *Picea canadensis* (Mill.) BSP.

In discussing *Pinus balsamea*, Mr. Farwell argues as follows: "During the decade (1753–1763) above referred to Miller published and described under the old style of nomenclature four species of this group and later illustrated at least one of them, the White Spruce. These publications of Miller brought the species prominently before Linnaeus who readily recognized the claims of the White Spruce to specific rank and on the strength of Miller's publications, accorded it such as *Pinus canadensis* in the second edition of the Species Plantarum. Rehder claims that the specific name in *Pinus Balsamea* is indicative of what Linnaeus meant and furthermore that it shows Linnaeus did not get all his information regarding the Balsam Fir from the Hemlock synonyms cited under it. Does not the same reasoning apply when considering *P. canadensis?* Or will Mr. Rehder deny that it does

[1] Flora Virginica, p. 191. 1743.

and insist that Linnaeus obtained the specific name 'canadensis' from the writings of Gronovius on Virginia and the Hemlock Spruce? The entire internal evidence shows conclusively that Linnaeus had the White Newfoundland Spruce in mind when he published *Pinus canadensis* notwithstanding he drew up his diagnosis from Gronovius, which, under the circumstances, was unfortunate. The proper specific name, therefore, for the Hemlock Spruce is the one first applied to it, that of *americana*, and the correct binomial, *Tsuga americana* (Miller) Farwell." (Rhodora **17**: 168.)

In establishing *Pinus canadensis,* Linnaeus left under *P. balsamea* the synonyms of Plukenet and Ray probably because he was uncertain about them. The synonym of Gronovius, however, he places under *P. canadensis.* Why?

That Linnaeus meant that his *P. canadensis* should stand for a Spruce as we understand this genus is out of the question. This is readily seen from his description of the European spruce (*Pinus abies* L.) "*Pinus foliis solitariis subulatis mucronatis laevibus bifariam versis.*" etc. (Sp. Pl. 1421. 1763.) when compared with the descriptive phrase for *Pinus canadensis.* "*Pinus solitariis linearibus obtusiusculis submembranceis*" etc.

The last word excludes the Spruce theory. I question very much if Linnaeus really knew anything about Miller's species except through the brief description and figure. Miller published his work in 1759 and it is altogether unlikely that Linnaeus could have become acquainted with the tree itself or had any notion about it except through the description.

That Linnaeus should have taken up the Gronovian synonym and put it where he did, Mr. Farwell considers "unfortunate."

Linnaeus separated from the concept of *Pinus balsamea* an element which had not been quite clear to him for a number of years but which he evidently thought belonged somewhere else.

Under the "Gronovian description of *Abies foliis solitariis* etc. (*Pinus canadensis*), the following statement is made.

"*Folia linearia, plana, tenuissima, carinata, obtuse, confertim mata, solitaria. Coni magnitudine Fragae, ovati, acuminata, squamis numerosis planis subrotundis obtusissimis.*" (Fl. Virg. 191.) In the second edition of the Flora Virginica the vernacular name Hemlock Spruce-Firr is added.

Mr. Farwell states that Clayton's no. 547 is the basis for the description *Abies foliis solitariis*. . . . Gron. Fl. Virg. 191.

This is the very specimen upon which the additional note given above is based. This note was written by Linnaeus himself when he (at that time living in Holland) and his bosom friend Gronov elaborated Clayton's notes on the flora of Virginia prior to 1739.

For this reason the Claytonian plant which Linnaeus himself knew has the only claim to the name *Pinus canadensis*. Since the Linnaean description is definitively that of the hemlock while the Linnaean citations are a mixture of names referring to the two species (*Tsuga canadensis* and *Picea canadensis*) the former is the only clear element in the concept of the Linnaean species and should determine the application of the Linnaean name. Under the circumstances it seems "unfortunate," not that Linnaeus placed the reference to the Flora Virginica under a specific description drawn up almost verbatim from the Gronovian name cited under it, but that he included in his species the plant of Miller which in the three features distinctive of the hemlock spruce ("foliis linearibus obtusiusculis submembranaceis") is utterly at variance with the description given by Linnaeus of his *Pinus canadensis* — i. e., *Tsuga canadensis* (L.) Carr.

Bureau of Plant Industry, Washington. D. C.

A Manual of the Grasses of Illinois.[1]— This manual gives descriptions of 63 genera and 204 species with keys to the genera and to the species. An introductory account of the structure of grasses includes the morphology necessary for the student who wishes to undertake the study of the family. Each species is illustrated by a figure of the spikelet and a few by a figure of the inflorescence or by a habit sketch of the entire plant. The drawings are somewhat impressionistic but nevertheless will be very helpful to the student.

The work is based upon a study of specimens and is not a compilation, a fact which differentiates this from several other articles dealing with local grass-floras. The descriptions are as untechnical as consistent with precision. The keys are artificial but thereby more usable by the amateur for whom the book is intended.

Appended to the descriptions of the species are notes on habitat, distribution, and economic value, and a detailed list of specimens.

The author studied the important local collections including that at the Field Museum, and also visited the National Herbarium. The work shows every evidence of careful investigation and in both form and substance is a model for a local flora.— A. S. Hitchcock, Washington, D. C.

[1] The Grasses of Illinois by Edna Mosher. Ill. Agr. Exp. Sta. Bull. **205**: 261–425. 1918.

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AN INTERGENERIC HYBRID IN THE CYPERACEAE.

M. L. Fernald.

(Plate 125.)

In September, 1915, Mr. C. A. Weatherby discovered on the sandy shore of Simmons Pond in Dennis, Massachusetts, a very remarkable plant which combined the aspect of *Rynchospora* with elongate many-scaled spikelets similar to those of *Cyperus*. The material originally collected was practically all sterile, the spikelets bearing no well-formed flowers. In view of the surprisingly large number of representatives known on Cape Cod of extreme austral groups, attempts were made to identify the Dennis plant with austral genera of the *Cyperaceae*, but nothing was found with which it could be satisfactorily placed.

In August, 1918, Mr. Bayard Long and the writer visited Simmons Pond with the hope of rediscovering Mr. Weatherby's anomalous plant, which happily was found at apparently the original station, a single tussock from which a portion had obviously been removed. A few additional specimens were taken but the root was undisturbed, and study of this material shows it to be identical with Mr. Weatherby's specimens except that in the new material a few aborted flowers are present. These flowers completely lack a perianth, as in *Cyperus*, but are surrounded by 2 or 3 scales, as in *Rynchospora*, and the minute and shrunken achene is capped by a clearly discernible, though shrunken, tubercle, as in *Rynchospora*. The few flowers found so clearly combine the traits of *Cyperus* and *Rynchospora*, the genera which are closely simulated by the inflorescences of the plant, that it

seems a safe conclusion to state that this colony is a sterile hybrid of members of these two genera.

The only members of the genera found on the sandy beach of Simmons Pond are the common *Cyperus dentatus* Torr. and *Rynchospora capitellata* (Michx.) Vahl.[1], the plant which has been generally known in the northern United States as *R. glomerata.* The hybrid colony has the foliage much firmer and more leathery than in the *Rynchospora,* in this character strongly suggesting *Cyperus dentatus.* The culms are densely cespitose, as in the *Rynchospora,* and are without any suggestion of the elongate stolons of the *Cyperus.* The cauline leaves are rapidly reduced in size, as in the *Rynchospora,* and the axillary and terminal corymbs are strongly castaneous as in that plant but with a more pronounced umbelliform aspect, while the very slender spikelets have the aspect of those of a *Cyperus,* being linear-cylindric with very numerous (20–40) closely imbricated somewhat carinate scales. The latter, however, are spirally arranged as in *Rynchospora* but have the characteristic short awn of *Cyperus dentatus.* In the absence of a perianth such flowers as have developed show traits of *Cyperus* but in the large subulate tubercle and the secondary spikelets *Rynchospora capitellata* is suggested.

It is certainly a very unusual and possibly an unprecedented circumstance to find an apparent hybrid between plants of such remote affinity as *Cyperus* and *Rynchospora,* members of very different tribes of the *Cyperaceae.* The characters, however, are so conclusive a blend of those of the two common members of these genera at Simmons Pond that it is difficult to avoid the conclusion that this colony has thus arisen. Through the kindness of Mrs. Weatherby, who has freely given the use of her skill, the habit and essential points of this interesting plant are shown in Plate 125. The plant, being of such unusual interest, should have a definite name for convenience of reference and it is here proposed as

× Cyperus **Weatherbianus,** n. hybr. = Cyperus dentatus × Rynchospora capitellata, habitu ut apud *Rynchosporam capitellatam;* culmis caespitosis 3–4.8 dm. altis gracilibus laevibus; foliis subcoriaceis basilaribus anguste linearibus elongatis, caulinis 5–7 valde reductis; corymbis subumbelliformibus terminalibus axillaribusque, terminalibus 1.3–2 cm. diametro; spiculis confertis valde

[1] See Blake, Rhodora, xx. 27 (1918).

adscendentibus castaneis anguste lineari-cylindricis 0.5–1 cm. longis; squamis 20–40 densissime spiraliter imbricatis castaneis membranaceis oblongis 1.5–2 mm. longis subcarinatis breviter aristatis; floribus sparsissimis plerumque nullis; spiculis secondariis ut apud *Ryncho-sporam* minutis; perianthiis nullis; achenio abortivo minuto, stylo 2-partito, tuberculo subulato.

Habit as in *Rynchospora capitellata;* culms cespitose, 3–4.8 dm. high, slender and smooth: leaves somewhat leathery; the basal narrowly linear, elongate; the cauline 5–7, greatly reduced: corymbs somewhat umbelliform, terminal and axillary; the terminal 1.3–2 cm. in diameter: spikelets crowded, strongly ascending, chestnut-brown, slenderly linear-cylindric, 0.5–1 cm. long: scales 20–40, very densely spirally imbricated, chestnut-brown, membranaceous, oblong, 1.5–2 mm. long, somewhat keeled, short-awned: flowers very scarce, mostly wanting: secondary spikelets as in *Rynchospora,* minute: perianth wanting: achene aborted, minute; style 2-parted; tubercle subulate. — MASSACHUSETTS: sandy shore of Simmons Pond, Dennis, September 30, 1915, *C. A. Weatherby* (TYPE in herb. New England Botanical Club), and collected apparently from the same clump, August 22, 1918, *Fernald & Long,* no. 16,287. PLATE 125.

GRAY HERBARIUM.

EXPLANATION OF PLATE 125.

Fig. 1. ×*Cyperus Weatherbianus,* portion of clump × ½.
Fig. 2. " " terminal corymb × 1.
Fig. 3. " " spikelet × 2.
Fig. 4. " " scale × 6.
Fig. 5. " " denuded rhachilla, showing secondary spikelets × 15.
Fig. 6. *Cyperus dentatus,* spikelet × 2.
Fig. 7. *Rynchospora capitellata,* spikelet × 2.

FURTHER NOTES ON POTAMOGETON.

HAROLD ST. JOHN.

Potamogeton vaginatus Turcz. is represented in the Herbarium at the Jardin des Plantes, Paris, by a suite of specimens with abundant fruiting spikes. These show that in spite of the phrasing of the original description[1] and of the colored representation in Fryer's

[1] Turcz. Bull. Soc. Nat. Moscou, xi. 102 (1838), xxvii. 65 (1854), Fl. Baical.-Dahur. ii. 162 (1856).

Potamogetons of the British Isles,[1] this species, *P. vaginatus*, has its stigma not terminal but, rather, laterally and asymmetrically placed. There is some variation in this character, but it occurs in fruits from the same spike, rather than definitely on separate plants from distinct regions. This makes it clear that the large-sheathed species with many whorls of fruit, described from the northern part of North America as *P. moniliformis* St. John, cannot on any character be separated from the Eurasian plant. *P. moniliformis* St. John is, then, a synonym of *P. vaginatus* Turcz., a rare and local, but typically circumpolar plant which should be sought in the waters of all the cooler parts of the northern hemisphere.

Whether the name *Potamogeton marinus* L. or *P. filiformis* Pers. should be adopted for the northern setaceous-leaved species is a question that has constantly recurred. The writer [2] in 1916 discussed the point and concluded that the name *P. filiformis* Pers. would have to be adopted. In the Herbarium at the Jardin des Plantes, Paris, is a sheet of this species collected by Nolte. On the ticket he has written a full synonymy with page references, and a discussion of the pros and cons. Since Nolte has frequently been accredited the authorship of the name *P. filiformis*, this bit of evidence seems worth quoting.

"*P. pusillum* Boccon. dubiae
P. setaceus Schumacher
P. filiformis Pers.
Nolte; Chamisso & Schlechtendal, [etc.]
Monsieur Fries pretend la recontraidre Linné *Potam. marin!* Oeder: etc. fl. Dan. pretend que le *pectinatum* soit le *Potam. marin.* Hartmann pretend que la plante que Monsieur Fries a nommé *Potam. zosteraceus* soit le *marinus*.
je m'excuse au *P. marin!*"

It is clear, then, that Nolte decided that *P. marinus* L. could not be exactly identified and that *P. filiformis* Pers. must be adopted as the name of this species.

Somewhere in France.

[1] Freyer, Pot. Brit. Isl. t. 58 (1915).
[2] St. John, Rhodora, vii. 133 (1916).

REPORT OF COMMITTEE ON FLORAL AREAS.

(*Continued from page 185.*)

Halophytic Species.

Ranunculus Cymbalaria follows the sea shore, thriving in salt marshes and on brackish shores. It is less frequent southward, with only three stations known on the Connecticut sea-coast.

Coastal Species.

Ranunculus laxicaulis and *R. sceleratus* are mainly coastal in our area, but not halophytic, seeking out clayey streams and pools; the former running east to Deer Isle, the latter to Brunswick, Me. Both follow the lower Connecticut river inland, the former to Alstead, N. H. There is a lone station for *R. sceleratus* at Sheffield, Mass., on the Housatonic. It also occurs near Lake Champlain at Colchester and Burlington, Vt. (Mrs. N. F. Flynn).

Northern Species.

Ranunculus pennsylvanicus	Ranunculus septentrionalis
" reptans	" abortivus, var. eucyclus

These plants avoid southeastern New England entirely, but have scattered stations in other parts of Massachusetts and Connecticut.

Southern Species of Dry Soils.

Anemone cylindrica	Hepatica americana
" virginiana	Ranunculus hispidus
Anemonella thalictroides	Thalictrum dioicum
Aquilegia canadensis	" revolutum

Anemonella thalictroides, Ranunculus hispidus and *Thalictrum revolutum* are limited to southern New England, while the other species

range north to central Maine. *Hepatica americana* also grows in Nova Scotia.

Calciphile Species.

Northern	Anemone canadensis
	" multifida, var. Hudsoniana
	" parviflora
	" riparia
	Clematis verticillaris
	Thalictrum confine
Alleghenian	Hepatica acutiloba
	Ranunculus allegheniensis
Southern Trap-rock	Ranunculus fascicularis
	" micranthus

The calciphiles are very interesting, from the closeness with which they follow the calcareous rocks. They seem to depend on lime in the soil. The northern group contains species abundant north and west of New England. *Clematis verticillaris* is the most generally distributed of these, for it does not depend entirely on substrata for its lime, but finds it sometimes in rich humus on other rocks, as on quartzite at Killingly, Conn.[1] *Anemone riparia* seems to have sought out calcareous areas throughout, although especially abundant in Aroostook County and western Vermont. *A. canadensis* is abundant in the alluvium of the St. John and Penobscot valleys in Maine, in the Champlain region and in the Housatonic valley. The stations in eastern Massachusetts seem to be introduced.

Thalictrum confine, discovered at Van Buren, Ft. Fairfield and Caribou, Maine, by Prof. M. L. Fernald, has also been found on ledges along Lake Champlain, from Ferrisburg to North Hero. *Anemone multifida,* var. *hudsoniana* grows in ledges of the St. John River at St. Francis and by the Fish River at Fort Kent, and at Aroostook Falls in New Brunswick. This was also found by Robbins and others in the

[1] An old report in Archives of Science, vol. 1, no. 5 (1872) by G. H. Perkins, gives a record of *C. Viorna* from Wantasket Mt., N. H., by C. C. Frost. Undoubtedly this was *C. verticillaris*.

gorge of the Winooski River in Colchester, Vt., also at Highgate Springs, Vt. (Jesup). *A. parviflora* is not represented by any specimens from New England. It was reported by Dr. George L. Goodale (Ag. & Geol. of Me. 366, 1861) "along the shore on a wet soil especially in wet and disintegrating slates" and in Ag. & Geol. of Me. 125, 1862 "abundant along the main river in the disintegrating slates." The context shows that Goodale was exploring the main St. John River from Ft. Kent to Seven Islands, a region little visited by botanists since that time. As Prof. Fernald says in litt. "the habitat, wet disintegrating slate, is exactly the habitat of *A. parviflora* on the Restigouche River, just east of the St. John and through the Gaspé and Newfoundland calcareous regions."

Hepatica acutiloba is very abundant in moist calcareous regions of Vermont, Franklin and Berkshire counties, Mass., and Litchfield County, Conn. It is known at Lancaster, N. H., and Alstead, N. H., and is reported as rare by Batchelder in the vicinity of Manchester (Proc. Manchester Inst. Arts & Sci. IV. ii. 24, 1909. This report needs confirmation by specimens). Curiously enough, Eugene P. Bicknell found a lone station for this in August, 1896, at York, Me., "one luxuriant cluster in rich deciduous woods near the York River, about one mile above the railroad bridge." This is more common in the moist calcareous regions of the Green Mts. than in the drier Taconic Range. Sometimes it occurs on trap rock, as at Simsbury, Conn. This plant ranges south to Georgia along the mountains, also west to Minnesota. It has thus a typical Alleghenian range.

Ranunculus allegheniensis has the range its name suggests, but is likewise abundant in dry diorite areas around Boston and has been found in moist soil on Assonet Neck in Berkeley, Mass., and at Lincoln, R. I., by S. N. F. Sanford. Northward it is known only from West Lebanon, N. H. (Dr. G. G. Kennedy), Smugglers Notch, Vt. (E. F. Williams), and West Haven, Vt. (George L. Kirk).

Ranunculus micranthus and *R. fascicularis* seem to prefer dry trap rock. The former is occasional around Boston, has one station in Hampden Co., Mass., appears at Limerock, R. I., and along the trap ridges of central and western Connecticut. *R. fascicularis* grows in the vicinity of Boston, especially over diorite, is frequent in the Connecticut valley in Massachusetts, and occurs at scattered localities in the western half of Connecticut, with an isolated station at Franklin. In Vermont it has been collected at Snake Mt., Weybridge

(E. Brainerd). There are old printed records, with no specimens, from Burlington, Norwich and Brattleboro, and it is also in Jesup's Hanover list.

Miscellaneous Species.

Caltha palustris	Ranunculus longirostris
Cimicifuga racemosa	" Purshii
Hydrastis canadensis	" reptans, var. ovalis
Ranunculus delphinifolius	Thalictrum dasycarpum
Trollius laxus	

These plants seem not to fall definitely into any of the above groups, nor can they, with the data at hand, be placed altogether satisfactorily in groups of their own.

Caltha palustris has the most perplexing range of any species in the family. It is very abundant in wet, mucky woods and meadows in southern New England, follows up the Merrimac to Concord, N. H., and occurs also along the coast as far as southeastern Maine. Elsewhere it seems to be largely a plant of heavy clay soils in calcareous areas. It is especially abundant in Aroostook county and the Piscataquis valley (M. L. Fernald), with scattered stations at Orono and Skowhegan in central Maine. It is also in northern Coös county, N. H. (A. S. Pease), at Hanover, N. H. (G. G. Kennedy) and in calcareous regions of Vermont. It is abundant at an elevation of 2000 ft. in a spruce swamp at Walden, Vt., but seems to avoid the higher mountainous regions.

Cimicifuga racemosa finds its natural eastern limit in southwestern Connecticut. Other stations appear to be introduced. It belongs to a small group of plants, represented by *Liquidambar Styraciflua* and *Heuchera americana*, of coastal plain or Alleghenian range which touch New England only at its southwestern corner. They should perhaps be classified with the "Southern species of dry soils" but are noteworthy because their range in our region is so limited.

Hydrastis canadensis has been found only at Shelburne, Vt. (F. H. Horsford), Weybridge, Vt. (W. W. Eggleston), Plainville, Conn. (J. N. Bishop), and at the base of Meriden Mt., Southington, Conn. (Mrs. E. R. Newell). *Trollius laxus* has a more limited range and in

New England has been found only in northwestern Connecticut. Mr. E. E. Brewster found it in a swampy meadow at 1100 feet elevation in Cornwall in 1879, and it also occurs in a swampy wood-margin in Canaan. Both of the foregoing are species of the northeastern Mississippi basin east of the prairie and the adjacent Alleghenian region, and just reach western New England. They are not, perhaps, strictly calciphiles but our stations for them are in more or less calcareous districts.

Ranunculus longirostris is rare in Vermont and local at Salisbury, Conn. Its New England range is thus similar to that of the two preceding species, but according to the manuals, its general range is much more extended.

Ranunculus delphinifolius is a water plant with scattered stations, not reported from the northern half of Maine and New Hampshire, southern Vermont and Cape Cod. More reports are needed for conclusions.

R. Purshii was discovered by Prof. M. L. Fernald at New Limerick, Aroostook county, Me., and later at Phair in the same region by C. H. Bissell and R. W. Woodward. These are evidently southern limits of a circumpolar species. *R. reptans,* var. *ovalis* is more southerly than the species in its range, but not enough specimens are available for generalization.

Thalictrum dasycarpum is known only in southeastern Connecticut at Franklin (R. W. Woodward) and at Groton (C. B. Graves). The specimen from Milton, Mass., quoted in Rhodora xviii. 168, 1916 was incorrectly determined.

C. H. Knowlton.
W. S. Ripley, Jr.
C. A. Weatherby.

CARDAMINE OLIGOSPERMA AND ITS NEAR ALLIES.

Wilhelm Suksdorf.

In Mr. G. S. Torrey's article "The Varieties of Cardamine oligosperma" (Rhodora 17 p. 156, 1915) my notes on *C. oligosperma* and related forms were quoted. Since that time I have been able to make some further examinations and still believe that these forms should

be treated as species. I venture, therefore, to make the necessary changes, and it may be well to point out at the same time a few errors or inaccuracies that occur in those notes spoken of.

Cardamine lucens (G. S. Torrey) n. comb. *C. oligosperma* var. *lucens* G. S. Torrey, Rhodora 17, p. 157. Leaflets 7–11 (as in *C. oligosperma*); petals very narrowly cuneate or oblanceolate, tapering gradually to the base, 2 mm. long, about twice as long as the calyx; pods 2 cm. long or less, a little over 1 mm. wide, their pedicels 4–14 mm. long or sometimes longer (26 mm.) the lower usually much longer than the upper.

Cardamine bracteata (O. E. Schulz) n. comb. *C. hirsuta* subsp. *oligosperma* var. *bracteata* O. E. Schulz (1903). *C. oligosperma* var. *bracteata* G. S. Torrey, Rhodora 17, p. 157 (1915). Leaves with 3–7 leaflets, the upper pinnately parted rather than pinnate; petals spathulate (as in *C. oligosperma,* but smaller) 2 mm. long, not twice as long as the calyx; pods 2 cm. long or usually shorter, 1.5 mm. wide, the lower on pedicels 4–10 (or 14) mm. long; seeds orbicular with a narrow thin pale margin.

C. oligosperma differs from the other two species by a more abundant (and longer) pubescence which extends to the ovary; by its longer seeds which are 1.5 mm. long and 1 mm. wide; and by larger flowers (3 mm. long) and short pedicels (2–8 mm. long). In all three species the number of seeds is about the same, namely 15–20 or less to a pod; but the seeds being much longer than broad in this species, the pods are often 2.5–3 cm. long.

C. unijuga Rydb. may also be a distinct species if absence of bracts and fewer leaflets are constant characters. According to Rydberg the pods have 8–12 seeds only, but his figure of the plant seems to indicate that there may be more sometimes. This plant appears to be nearest to *C. bracteata.*

Some specimens collected about a shaded spring this season, make it seem probable that my plant referred to *C. oligosperma* var. *unijuga* by Mr. Torrey, may be a shade form of *C. bracteata;* however, further observations may be needed to prove it. The type specimen of *C. bracteata* grew in a sunny place.

At the time my notes were written, nothing was known to me of Mr. Schulz's monograph. My specimen of the plant distributed as true *C. oligosperma* in my sets of 1885 was not then where it belonged in my collection and therefore was not examined. The result was

that I believed it to be the common form (*C. lucens*) whereas it really was part of the type collection of *C. bracteata.* In my own collection this plant is numbered 723 and (503), the latter being a provisional number under which a specimen was sent away for determination. I was not aware of the importance of numbering plants, until distributions had been made for several years and so the numbers were placed on the lists only and not on the plant labels. So it happens that many of the earlier specimens have or should have two different numbers on their labels, one of them in parenthesis. Many specimens received no number at once when collected, but years later, and for that reason mistakes sometimes occur. Thus the number of the plant referred by Mr. Torrey to *C. oligosperma* var. *unijuga,* although collected in 1881, should be 7238 instead of 723, the latter being the proper number of the type collection of *C. bracteata.* When numbering was begun more carefully, it was thought necessary to have a separate set of numbers for each state where collections had been made. This need not cause doubt or confusion where the fact is known. Mistakes cannot always be avoided, but they may be corrected sometimes. A clerical error of little or no consequence occurs in Mr. Torrey's article in the name of a county: Skaminia should be Skamania.

Bingen, Washington.

The Flower of Agalinis — A Correction.— In the description of the flowers of *Agalinis,* on page 135 of the current volume of Rhodora, two words should be inserted, so that the statement on line 5 shall read: "*around and* between which lines are almost always red-purple spots." The spotting is confined to the anterior side of the corolla, but there frequently, indeed most frequently, lies along the two yellow lines. I regret the oversight which permitted such an error or partial statement of fact; however, as affecting the contrast with *Aureolaria* the point is unimportant. *Agalinis* is still to be distinguished by the elaboration of a very definite color-pattern.

In speaking of the two lines as "yellow," allusion is made to the color pigment present, not to its intensity. Possibly more often the word "yellowish" should be preferred in description. Although

the corolla-color of *Agalinis* never conforms to my conception of "purple," I have yet used that term in the compound "red-purple" in describing the spotting. I believe that this accords with current usage; however the expression "red" or "dark-red" is certainly truer, as the color seems to be but an intensification of the ground-color of the corolla. We are much in need of standard nomenclature for color; perhaps the use of Ridgway's "Color Standards and Nomenclature" is best, though to most of us his terminology would sound strange.— F. W. Pennell, New York Botanical Garden.

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Figs. 1–5. × CYPERUS WEATHERBIANUS.
Fig. 6. CYPERUS DENTATUS.
Fig. 7. RYNCHOSPORA CAPITELLATA.

Rhodora

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SOME NORTH AMERICAN REPRESENTATIVES OF BRAYA HUMILIS.

M. L. Fernald.

Braya humilis (C. A. Meyer) Robinson, var. **novae-angliae** (Rydberg), n. comb. *Pilosella novae-angliae* Rydberg, Torreya, vii. 158 (1907). *Arabidopsis novae-angliae* Britton in Britton and Brown, Ill. Fl. ed. 2, ii. 176 (1913), as to the plant of Willoughby Mountain, Vermont.

In 1907 Rydberg proposed as a species the well-known plant of the Willoughby cliffs which has been passing as *Braya humilis*, transferring it to Kosteletzky's genus *Pilosella* and calling it *P. novae-angliae*, distinguished from true *Braya humilis* by "the more compact habit, the scant pubescence, the smaller flowers, the more slender pod, and the longer style;" and in 1913, Britton, putting the Willoughby plant into Schur's *Arabidopsis*, stated that the pods are "glabrous" and he included with the Willoughby material the plants of Anticosti and of the north shore of Lake Superior.

The writer has not seen the Lake Superior material, but two collections from Anticosti show that there the plant has the pods quite as pubescent as in authentic material from the Altai of Meyer's *Sisymbrium humile*, which formed the basis of *Braya humilis* Robinson. Similarly the plant of western Newfoundland, as well as from Severn River, Keewatin, and the Columbia Valley, British Columbia, closely matches in habit, pubescent pods, size of flowers, and all other characters the Altai plant; i. e., *Braya humilis* is scattered across boreal America and the Anticosti plant, at least as represented in the Gray Herbarium, does not have a *glabrous* pod. Furthermore, a large

series of specimens (25 collections) from Willoughby, in all stages of development, shows that the young pods are distinctly pubescent but in maturity become glabrate, so that at best the Willoughby plant is a weak variety.

Arabidopsis Schur, Enum. Pl. Trans. 55 (1866) which had but a single species, *A. Thaliana* (L.) Schur,[1] based on *Arabis Thaliana* L., has the same type as *Pilosella* Kostel. Enum. Hort. Prag. 104 (1844) and as *Stenophragma* Čelak.[2] and, although *Arabidopsis* is said to go back to DeCandolle's *Sisymbrium*, section *Arabidopsis*, it is noteworthy that Schur recognized only the single species *A. Thaliana* and that the latter plant was placed by DeCandolle under *Arabis* not under *Sisymbrium*, sect. *Arabidopsis*.

Whether or not *Pilosella* Kostel. (*Arabidopsis* Schur or *Stenophragma* Čelak.) is treated as a distinct genus or as a subgenus of *Sisymbrium*, its status as a genus or as a subgenus is at once invalidated by thrusting into it species of *Braya* Sternb. & Hoppe, Regensb. Denkschr. i. pt. 1, 65 (1815). And surely no one who will take the time and trouble to examine with moderate power the septum of *Pilosella novae-angliae* Rydb. or *Arabidopsis novae-angliae* Britton can doubt that this plant is a *Braya*. The fact that the Willoughby and Anticosti plant has the septum of *Braya* and not of *Sisymbrium* and *Arabidopsis* or *Stenophragma* has already been pointed out by Robinson.[3] Microscopic examination of the septa of many specimens, from Newfoundland, Anticosti, Willoughby, Keewatin, British Columbia and Siberia of *Braya humilis;* of the northwestern species labeled in Rydberg's own hand *Pilosella Richardsonii* Rydb.; of the Arctic *B. purpurascens* (R. Br.) Bunge; of the European *B. alpina* Sternb. & Hoppe, and of several other boreal species, shows clearly that these plants all have the characteristic septum of *Braya*, with the thick-walled cells elongated transversely. Furthermore, the starved and dwarfed material of *Braya humilis* (the American specimens of which are included by Britton in *Arabidopsis novae-angliae*) from

[1] This appears in the Illustrated Flora, ed. 2, as *Arabidopsis Thaliana* (L.) Britton, but Schur published the name in 1866 when he published the genus.

[2] *Index Kewensis* cites *Stenophragma* Čelak. as published in Arch. Naturw. Landesd. Boehm. iii. 445 (1875); Britton starts it in Flora, lv. 438 (1872), but in the latter very critical discussion of the characters of the genus Čelakovsky himself states that the genus, based on *Arabis Thaliana*, was published by him in his *Flora der Prager Umgegend* (1870), a work to which the present writer has been unable to refer.

[3] Robinson in Gray, Syn. Fl. i. pt. 1, 141 (1895).

exposed ledges and shingle on Table Mt., Port à Port Bay, Newfoundland (*Fernald & St. John*, no. 10,837), although clearly a dwarfed alpine extreme of the Anticosti and Keewatin and Altai plant, is so like Huter's specimens of *Braya alpina* from the Carinthian Alps (Fl. Exsicc. Austr.-Hung. no. 580) as to be separated only by its more slender pods. *Braya humilis, Pilosella* (or *Arabidopsis*) *novae-angliae* and *P. Richardsonii* are, likewise, distinctly perennial plants, in this agreeing with the other species of *Braya,* not with the annual *Arabidopsis Thaliana.*

Besides *Braya humilis,* which occurs in northwestern America in Alaska and British Columbia, there is another western species, in the mountains of Alberta and British Columbia. This is

BRAYA **Richardsonii** (Rydberg), n. comb. *Pilosella Richardsonii* Rydberg, Torreya, vii. 159 (1907).

GRAY HERBARIUM.

AMARANTHUS POWELLII AND DIGITALIS LANATA IN NEW ENGLAND.— Three plants, recognized as something different, sprang up in the garden of Mr. John Robinson at Salem, Massachusetts, this season. They were allowed to grow and on July 12 were collected and taken to the Gray Herbarium, and determined as *Amaranthus Powellii* Wats. from the far west. My attention is called to the fact that this species has been found as a weed in cultivated ground at Tewksbury by Messrs. *E. F. Williams & W. P. Rich,* in 1900, and on a roadside at Weston by Mr. Williams some years earlier: see RHODORA, xvii. 179 (1915).

The collection of Essex County plants is indebted to Mrs. Paul A. Dodge of Rowley for fine specimens of a conspicuous and attractive adventive from the Danube River region — *Digitalis lanata* Ehrt. This was discovered growing rankly on a heap of rakings at the foot of Ox Pasture Hill in Rowley. Further search and inquiry secured the information that this species had probably been introduced in soil with plants imported from Holland, and that it was not uncommon in a limited station on the hill.— ALBERT P. MORSE, Peabody Museum of Salem, Massachusetts.

EXOTIC PLANTS ESTABLISHED IN MIDDLESEX COUNTY, MASSACHUSETTS.

William Brewster.

Two sisters, Miss Mary S. and Miss Harriet L. Eaton, living not far from the village centre of Concord, Massachusetts, at the rear of Sleepy Hollow Cemetery, are interested in birds and wild flowers and have long been familiarly acquainted with most of those occurring regularly in that neighborhood. Behind their house and cultivated grounds lies a neglected, grassy field, crowning a wind-swept hill-top. Here, some six or seven years ago, they found a yellow-flowered Vetch, growing in arid, rather sandy soil. Then represented by only a few plants it has since so increased and spread that it now covers a space ten or fifteen feet across with a tangled mat of semiprostrate stems and foliage, to the almost complete exclusion of all other vegetation. When first shown to me on June 27 of the present year, by Miss Mary Eaton, it was apparently passing out of bloom and already bearing pea-like pods in various stages of development although still adorned with many bright yellow flowers. Specimens of it taken then and there with Miss Eaton's kind permission have since been deposited in the Gray Herbarium where it has been identified as *Lathyrus pratensis.* According to the latest edition of Gray's Manual this species, naturalized from Europe, occurs in "fields and waste places," locally, from New Brunswick to New York and Ontario. It was reported from Concord about nineteen years ago by Mr. A. W. Hosmer, Rhodora, i. 223 (1899), and it may be of interest that it has persisted until this time. The specimen, deposited in the Gray Herbarium, is doubtless the one which formed the basis of the recent record in Rhodora, xx. 108 (1918).

After visiting the bed of Lathyrus, Miss Eaton and I were returning towards her house when some handsome tall shrubs or small trees, scattered along the line of a brush-grown stone wall, attracted our attention. In all there may have been ten or a dozen of them, varying in height from two or three to six or seven feet. They looked not unlike young Tupelos, having similarly smooth, glossy, obovate leaves and sparsely-distributed, reddish, berry-like fruit. But their

leaves were smaller than those of the Tupelo and the fruit proved on close examination, to be three- instead of one-seeded. Although Miss Eaton had seen them there before she could not name them, nor could I. We then thought they might have "escaped" from the neighboring Cemetery where, of course, all manner of exotic plants are, or may be, introduced from time to time. Only a few days later, however, I came upon two others near our farm house and at a distance of almost three miles from Sleepy Hollow. They were growing beside a cart path that crosses low-lying, peaty land once cultivated but now for the most part densely thicketed with high blueberry bushes, alders, maples, gray birches, etc. Here they must have been established for many a year, being apparently mature although no more than seven or eight feet tall. This, however, is said to be about the maximum height of the species which proves to be *Rhamnus Frangula* L., a Buckthorn, native to Europe and given in the Manual as established in Ontario, on Long Island and in northern New Jersey. It was kindly determined for me at the Gray Herbarium, from specimens of its branches, leaves and fruit obtained at Concord. These, I understand, are the first that the Herbarium has received from any locality in New England, although the species has recently been reported, in Rhodora, xix. 230 (1917), as found near New Haven, Connecticut, by Prof. G. E. Nichols.

Thus are we once more reminded of Thoreau's humorous maxim: "*Ne quid quæsiveris extra te Concordiamque.*"

Concord, Massachusetts.

A SMOOTH-FRUITED FORM OF ASCLEPIAS SYRIACA.

J. R. Churchill.

Our common Milkweed (*Asclepias syriaca* L.) is abundant in Berkshire County, Massachusetts, as elsewhere, growing in open fields and along the roads and streams everywhere. Ordinarily it is easily recognized in flower by its stout and simple stem and its many large umbels of fragrant purplish flowers, and later, in fruit, by the large pointed mostly curved or falcate pods, which are softly tomentose and all "echinate" with warts or "soft spinous processes." The "echinate" pod is a diagnostic character by which this and a western species similar in this respect, are segregated in our manuals from the other species with smooth or unarmed pods.

So, on September 14, 1918, while botanizing in that part of Lanesboro, Massachusetts, called Berkshire, I was greatly interested to find growing in low open ground, with plants having the normal echinate fruit, a small colony of our Milkweed, bearing pods which were all straight, quite unarmed, and merely velvety. There was no vestige or rudiment of the spinous processes. Recourse to my herbarium also disclosed a plant, which I collected at Grafton, Massachusetts, Sept. 7, 1902, on which the two ripe pods were, like those from Berkshire, short, straight and quite smooth. Evidently I had noted and preserved the specimen, as often happens, for the very reason that, in the complete absence of the spinous processes, it conspicuously failed to conform to the echinate character ascribed to the fruit in this species. Nevertheless I had called it, "*A. Cornuti* Decaisne," the name by which this species was then known; and itself, curiously though unintentionally, suggestive of the "horns" which are normally present.

The only reference which I have found to this aberrant form is in the Supplement to the Synoptical Flora of N. A. Vol. II, Part I, where (p. 401) is the following note by Dr. Gray:—"A. Cornuti Decaisne, p. 91.—*A. grandiflora*, Bertol. Misc. Bot. xii. 47, t. 3, 4, 5, raised from seed from North America, by its flowers and follicles can be no other than this common Milkweed. Pods in this species are sometimes found with hardly a trace of the soft spinous processes,

sometimes with very long and shaggy ones." And this note is based upon a sheet in the Gray Herbarium containing six, more or less smooth-fruited inflorescences only, over the following label "Smooth and muricate follicles of *Asclepias Cornuti*, sent by. . . ."

In the private herbarium of Walter Deane, at Cambridge, also I find a similar series of follicles collected by J. H. Mellichamp in South Carolina, verified by Dr. Gray, and also "illustrating variation to smooth pod." Two other specimens of the smooth-fruited form may also be cited, one collected by Mr. Deane, at Waltham, Massachusetts, August 13, 1910, now in his herbarium, the other in the herbarium of the New England Botanical Club, collected by Sydney Harris, at Dedham, Massachusetts, September 27, 1896, both with unarmed fruit like my Berkshire material.

Apparently then the echinate character in pods of this species, heretofore so much relied upon, is not invariable, and it seems well to recognize so signal a departure from an established and familiar type. I have therefore ventured to call this Berkshire plant, with wholly unarmed follicles

Asclepias syriaca L. forma **inermis**, f. n., formae typicae similis differt folliculis omnino emuricatis saepius rectis.— Low open ground, Lanesboro, Massachusetts, September 14, 1918, *Churchill* (type deposited in the herbarium of the New England Botanical Club).

The closely similar specimens cited above from eastern Massachusetts and South Carolina would seem to indicate that this smooth-fruited form will be found widely distributed with the typical echinate-fruited one. Further study may disclose other differences which would justify a varietal or higher rank than seems at present warranted.

Dorchester, Massachusetts.

REPORTS ON THE FLORA OF THE BOSTON DISTRICT,—XXIX.

TEPHROSIA.

T. virginiana (L.) Pers. Dry sandy soil; well distributed but not very abundant.

TRIFOLIUM.

T. agrarium L. Fields and roadsides, common throughout.

T. arvense L. Dry sandy soil, very common throughout.

T. dalmaticum Vis. Dump, Dracut or Lowell (*C. W. Swan,* Aug. 6, 1884). Specimen in herb. N. E. Botanical Club. Adventive from Europe.

T. dubium Sibth. Waste land, S. Boston (*C. E. Faxon,* Sept. 30, 1878); sporadic in lawn, Hingham (*C. H. Knowlton,* June —, 1916).

T. echinatum Bieb. Wool-waste, Westford (*Miss E. F. Fletcher,* Rhodora xvii. 32, 1915). Native of southern Europe and Asia Minor.

T. hybridum L. Fields and roadsides, everywhere.

T. incarnatum L. Fields, occasionally persisting for one season after cultivation.

T. Macraei Hook. & Arn. Parker River mills, Georgetown (*Mrs. C. N. S. Horner,* —, 1886); wool-waste, N. Chelmsford (*W. P. Alcott,* no date). Specimens in herb. N. E. Botanical Club. Native of western North America and Chili.

T. medium L. Dry fields and pastures; many old specimens from Salem, Wenham and Danvers; also collected from Georgetown (*E. F. Williams,* July 10, 1901) and from Boston (*Asa Gray,* no date).

T. pratense L. Fields and roadsides, everywhere.

T. procumbens L. Roadsides and fields, frequent.

T. purpureum Lois. Westford (*Miss E. F. Fletcher,* Rhodora xv. 172, 1913). Native of southern Europe and western Asia.

T. repens L. Fields and pastures everywhere.

T. resupinatum L. South Boston (*C. E. Perkins,* Aug. 9, 1879).

Native of western Europe and the Mediterranean region. Specimen in herb. N. E. Botanical Club.

T. TOMENTOSUM L. Georgetown mills (*Mrs. C. N. S. Horner*, —, 1886). A very small specimen in herb. N. E. Botanical Club. Native of the Mediterranean region.

TRIGONELLA.

T. LACINIATA L. Charlestown (*C. E. Perkins*, July 4, 1879).

T. NOEANA Boiss. (*T. Cassia* Boiss. of Dame & Collins, Flora Middlesex Co. 26, 1888). Waste-heap, Lowell (*C. W. Swan*, Aug. 4, 1884).

T. RAMOSA L. Charlestown (*C. E. Perkins*, July 4, 1879).

The above specimens are in herb. N. E. Botanical Club.

VICIA.

V. ANGUSTIFOLIA Reichard. Waste ground, Lowell, Lynn, Wellesley and S. Boston.

V. ANGUSTIFOLIA Reichard, var. SEGETALIS (Thuill.) Koch. Waste places frequent. "On ye beach at Nehant" (*M. Cutler*, no date). Specimen in Gray Herb.

V. ANGUSTIFOLIA Reichard, var. UNCINATA (Desv.) R. & F. Dry gravel in field, Hingham (*C. H. Knowlton*, June 22, 1912).

V. Cracca L. Fields and roadsides, frequent.

V. HIRSUTA (L.) S. F. Gray. Waste places, rare; Newburyport, W. Newbury, Danvers, Lowell, Dracut, Boston, Hingham, Wellesley.

V. SATIVA L. Waif in garden, Topsfield (*Mrs. C. N. S. Horner*, no date); Jamaica Plain (*C. E. Faxon*, —, 1882).

V. TETRASPERMA (L.) Moench. Waste places and edges of woods, occasional.

V. VILLOSA Roth. Persistent after cultivation at Marshfield and Sherborn; perhaps elsewhere.

C. H. KNOWLTON } *Committee on*
WALTER DEANE } *Local Flora.*

ERRATA.

Page	26,	line	16,	for *Rhynchospora* read *Rynchospora.*
"	35,	"	28,	for **glandulosum** read GLANDULOSUM.
"	71,	"	2,	for *grandifolia* read *grandiflora.*
"	87,	"	6,	for ARKANSANA read ARKANSANUS.
"	87,	"	7,	for *arkansana* read *arkansanus.*
"	91,	"	10,	*for* arid *read* acid.
"	124,	"	9,	*for* Cheshire *read* Hillsboro.
"	184,	"	15,	*for* Thumb. *read* Thunb.
"	186,	"	34,	for *Balsamea* read *balsamea.*

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